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ABSTRACT

Presented are 11 papers given at a study institute on oral language skills antecedent to reading for educators of the speech, hearing, and learning disabled. Doris Johnson, in a paper entitled "Interrelationships Between Auditory Disorders and Higher Levels of Learning", stresses the importance of auditory comprehension for language development. A psychologist's viewpoint is given by Thomas Bever who warns that language cannot be adequately described using a single representational level. Language acquisition development and therapy is the topic of the paper by Lois Bloom, the keynote speaker. Dorothy Sparr reviews existing tests of reading readiness and notes trends for more sophisticated tests and increased individualized instruction. Multi-sensory instructional approaches including television are discussed by Vivian Horner. Visual learning is emphasized by Jack Debes. Bluma Weiner examines approaches to reading instruction in terms of the reading circuit and levels of experience. Reading for meaning is the level of reading behavior and instruction centered on by Phyllis Kornfeld. An instructional system, "The High Intensity Learning Systems-Reading", is described by Joan Hyman who also reports on a study evaluating the program's effectiveness. Norma Rees relates the role of the speech pathologist to the reading process. In the concluding remarks, Mardel Ogilivie encourages the interrelationship of disciplines in language study and development. (DB)

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A SPECIAL STUDY INSTITUTE ON
ORAL LANGUAGE SKILLS ANTECEDENT TO READING

Proceedings of a Conference
January 18, 19, 1973

THE HERBERT LEHMAN COLLEGE
BRONX, NEW YORK 10468

THE NEW YORK STATE
EDUCATION DEPARTMENT
BUREAU FOR PHYSICALLY HANDICAPPED CHILDREN
in cooperation with
THE NEW YORK CITY BOARD OF EDUCATION
BUREAU FOR SPEECH IMPROVEMENT

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U.S. Office of Education

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Gavin O'Connor

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PREFACE

This Special Study Institute, "Oral Language Skills Antecedent to Reading", was designed to acquaint regional directors, supervisors and teachers of the speech and hearing handicapped and of reading with the interrelatedness and interdependence of the processes involved in the acquisition of reading skills and auditory language skills.

In planning the Institute the following assumptions were made:

1. The meaning of an utterance is more than a combination of its elements.
2. The extent of a child's knowledge of oral language in a variety of communication contexts has some bearing on his academic achievement for reading. A child habituated in a restricted communication code will probably be impeded in learning to read.
3. Gaps in language skill must be identified and clarified to maximize the contributions of speech, language and reading specialists.
4. Reading is only "the tiger's tale"; the head of the animal is oral language comprehension.

The Institute sought to provide insight and understanding into the following: The fundamental knowledge concerning language acquisition; the relationship of oral language to reading; and the instructional systems employed to stimulate and facilitate the development of oral language and reading skills.

A recurring theme throughout but specifically emphasized by Dr. Johnson in "Interrelationships Between Auditory Disorders and Higher Levels of Learning" was the significance of auditory comprehension as the cornerstone on which language is built. Highlighted, too, was the importance of attention and the modification of rate in all language learning. In her discussion of the planning for the Children's Television Workshop, Dr. Vivian Horner offered a cafeteria of multi-sensory instructional approaches for interrelating oral communication, visual learning and reading. Interesting studies of the analysis of distraction and attention patterns and of the function of entertainment in learning were cited.

Within the discussion of coding and the modality used to get a child's language system functioning, Dr. Bever warned that one must not get stuck at a single level of description since a complete representation of language can not be achieved at any one level. In his presentation, Mr. Jack Debes demonstrated the effectiveness of visual learning. He recommended that teachers capitalize on the visual literacy that children in this technological McLuhan age already possess. Mrs. Spar emphasized the relationship between oral language interaction and reading readiness competency. She reviewed existing tests and pointed to a need for new tests, for more sophisticated interpretation of all tests, and for more individualized instruction to meet students' needs. A variety of approaches to the teaching of reading were discussed by Dr. B. Weiner, Dr. Kornfeld, and Dr. Hyman: Phonics, basal and linquistic readers, as well as experience based or individualized reading programs.

Interaction and lively exchange among the participants marked the luncheon and coffee breaks.

As an outgrowth of the sessions, many questions were raised. Some were answered by the staff. Since no conference can respond definitively to all situations, participants were stimulated to further investigation, research, and thinking in the area of language instruction. Many of the speech and reading personnel made plans to interact as a team in developing programs for their own school systems.

Feedback indicated that these activities are now being implemented.

The presentations as delivered were enhanced with the vocal dynamics of the experts, with film clips and with other visual aids. These assets are unfortunately lost in this written record.

Geraldine D. Chapey

THURSDAY, January 18

A.M.

8:30 - Registration

9:00 - Greetings by

NEIL G. McCLUSKEY, Ph.D., Dean of Teacher Education, Lehman College

JOHN E. LENT, Ed.D., Acting Director, Bureau for Speech Improvement

BEATRICE JACOBY, Ph.D., New York State Department of Education

JANE B. ALGOZZINE, M.A., Supervisor, New York State Department of Education

9:15 - DORIS JOHNSON, Ph.D., Associate Professor in Learning Disabilities, Northwestern University, Interrelationships Between Auditory Disorders and Higher Levels of Learning

11:00 - THOMAS G. BEVER, Ph.D., Professor, Columbia University, A Psychologist's View of Language Development and the Reading Process

P.M.

1:30 - Keynote Speaker

LOIS BLOOM, Ph.D., Professor, Columbia University Teachers College, Language Acquisition Development and Therapy

3:00 - DOROTHY SPAR, M.A., Coordinator of Reading, District 27, New York City Board of Education, Diagnostics and Reading

FRIDAY, January 19

A.M.

8:30 - Welcome by HELEN M. FEULNER, Ed.D., Acting Assistant Superintendent, Office of Special Education and Pupil Personnel Services

9:00 - VIVIAN M. HORNER, Ph.D., Director of Research, Children's Television Workshop, Language and Reading

10:00 - JACK DEBES, M.A., Director, Center for Visual Literacy, University of Rochester, Visual Literacy Program

11:00 - PANEL

BLUMA WEINER, Ph.D., Professor, Chairman Department of Special Education, Yeshiva University

PHYLLIS KORNFELD, Ed.D., Assistant Professor, Department of Curriculum and Instruction Yeshiva University

JOAN HYMAN, Ph.D., Director, Staff Development and Reading

P.M.

2:00 - NORMA REES, Ph.D., Executive Officer of Ph.D. Program in Speech, City University of New York, The Role of the Speech Pathologist in the Reading Process

3:30 - Concluding Remarks

MARDEL OGILVIE, Ph.D., Professor, Lehman College, City University of New York

INTERRELATIONSHIPS BETWEEN AUDITORY DISORDERS AND HIGHER LEVELS OF LEARNING

DR. DORIS J. JOHNSON

Dr. Doris Johnson, author of the book, "Learning Disabilities" with a foreward by Myklebust, is a recognized national authority and professional lecturer. She is a professor at Northwestern University.

INTERRELATIONSHIPS BETWEEN AUDITORY DISORDERS AND HIGHER LEVELS OF LEARNING

Dr. Doris J. Johnson

Language develops sequentially and somewhat systematically in most children. Often, however, this process is disrupted in children who have specific learning disabilities. Normally a child begins to comprehend the spoken word at nine or ten months. At approximately one year he begins to express himself verbally. Throughout the preschool years he evidences growth in vocabulary, in phonological patterns and in syntax. By the time he enters school he is quite prepared to superimpose a visual system on the auditory system. He develops a visual receptive language system through the process of reading instruction. Later he acquires a visual expressive system as he learns to write. Because auditory language is the base on which other symbol systems are built, it is critical for the learning disabilities teacher to carefully study several auditory processes and to determine possible effects on higher levels of learning. Typically, we need studies of the following:

1. Auditory acuity
2. Auditory discrimination - both verbal and nonverbal
3. Verbal comprehension - single words, sentences, and stories
4. Auditory memory span
5. Retrieval
6. Auditory sequencing
7. Syntax
8. Articulation

The purpose of these studies is to determine whether there are disturbances in processing information, and to evaluate the possible effects of a specific disorder on various areas of language, learning, and behavior. For example, if a child has a discrimination problem, what does it affect? Does it affect comprehension, articulation, or higher levels of learning such as syllabication and spelling? In some instances the problem interferes with meaning. For example, an eight-year-old was asked, "What is the difference between a calf and a colt?" His response was, "A calf is something you put on a broken arm, and a colt is something you wear outdoors." Similarly, a seventh grade girl was asked to define the word "slaughter", and she said, "It's what the mechanic does when he puts two pieces of wire together."

In other instances the discrimination problems primarily affect articulation. At times the problem interferes with reading, but not always. If the children have very good visual abilities, the printed symbol may stabilize the auditory.

Interrelated problems also can be noted among the children with retrieval disorders. Some improve when they read; others do not. Many show a wide discrepancy between oral and silent reading abilities because they comprehend the visual symbol but cannot "transduce" to the auditory; some also exhibit dysfluency. Excessive demands for oral reading should not be made if the students have difficulty with auditory recall.

Whatever the disturbance, we do need to investigate the interrelationships of these various areas of language, learning, and behavior. Without such a study the remedial plan is apt to be skill oriented, fragmented, and less effective than it could be.

After the problems have been identified, the clinician must then ask the question, "How can I modify the child's behavior?" In order to modify behavior, we are told repeatedly that specific goals must be defined. I agree; however, we also need to consider those factors which facilitate change. As clinicians, we must become more aware of critical input factors or variables that influence progress. An eminent physician once said that diagnosis requires great skill in sifting and sorting data, but clinical medicine (and we might add, clinical teaching) requires the manipulation of multiple variables. Likewise, clinical work with language-impaired children must include the study of those factors which contribute to learning.

The first variable pertains to the nature of the input stimulation and specifically to the number of sensory modalities being stimulated. If a child has a problem of auditory discrimination, of comprehension, or retrieval, or sequencing - through which sensory modalities shall we work? Because each child presents a unique pattern of deficits and strenths, it seems logical that we cannot use the same type of stimulation for all children. Bombarding a deficit function may not be effective. For example, if a child has a disturbance of auditory discrimination, usually we must do more than present pairs of phonemes or words. Similarly, if a child has a disturbance in visual perception, we must do more than present work sheets designed for that purpose.

To illustrate, two seven-year-olds in a class had difficulty perceiving differences between rotated figures such as the c and the u. When given work sheets with those figures, the boys refused to try and said, "I can't do that; it's too hard." The clinician's task was to find the proper combination of input stimulation that would help the boys discriminate the differences. Since Child A had good verbal comprehension, the teacher used simultaneous auditory-visual stimulation: "down, across, up" or "left, down, right." After only three or four stimulations, the child responded, "I got it - I can see it - let me do that." In contrast, child B had problems of verbal comprehension as well as visual discrimination problems. The clinician now asked the child to close his eyes while she guided his hand over each figure, saying nothing. After a few stimulations, she asked, "Do you feel the difference?" He could; then he was asked to open his eyes and see the difference.

The balance of input stimulation should be considered when we try to improve auditory discrimination. Instead of bombarding a child with various combinations of phonemes or words, we ask ourselves, "What options are open to the clinician?"

First, we have the possibility of intrasensory stimulation. This means that for brief periods of stimulation, the child is asked to close his eyes. We have found that some students cannot look and listen simultaneously. A six-year-old for example, was able to successfully complete a hearing test only when his eyes were closed. Often you can observe children turn away from the speaker or close their eyes when confronted with a difficult listening task. Many of us will close our eyes or turn away from a child to listen more carefully to his speech.

As one might expect, not all children profit from intrasensory stimulation. They need cues from other sensory channels. Some improve by watching the speaker's lips; they follow a visual movement plan. Others profit from seeing the visual symbol or the printed word. Still others need a unique cycle and balance of input stimulation.

A third-grade boy who could not perceive differences between words such as *pin* and *pan* learned only after the clinician first presented visual movements for the production of the two words. No sound was used. Next the teacher placed a mirror under her chin and asked the child to imitate the patterns she presented - again with no sound. Now the child was asked to feel the difference. Finally, he was asked to produce the sound as he imitated the movements. Only then did he begin to perceive the differences auditorially.

Whether we are dealing with problems of perception, comprehension, memory, or syntax, one of our questions in remediation pertains to the number of sensory modalities to be stimulated.

A second variable pertains to the *verbal or nonverbal quality* of the stimulation. It has been hypothesized that there are differences in the brain with regard to the processing of verbal and nonverbal information. We have been exploring these differences and find that certain children can process nonverbal information but not verbal. The reverse is also true; some process verbal but not nonverbal information. Others cannot process both verbal and nonverbal information simultaneously; they are overloaded.

A third variable to be considered is *intensity*. Although the children with specific language disorders have normal auditory acuity, we have found that it is sometimes necessary to amplify sounds or words for the child to perceive them. One such case was a seventeen-year-old student who was referred because of a serious reading disability. Although he was a senior in a suburban high school, he could not read above a second grade level. He also had problems affecting his auditory analysis skills, retrieval, and oral formulation. During a period of diagnostic teaching, the clinician used a portable binaural amplifier when working on auditory discrimination and analysis. This young man began to detect sounds which he could not perceive under normal circumstances. As he improved in perception, he began to make progress in reading and now is able to read at a ninth grade level.

A fourth variable is rate of input. Some children with language disorders are not able to process information at the same rate as the average person. One of our thirteen-year-olds has a serious problem of verbal comprehension but is superior in visual nonverbal skills such as art. Not long ago I visited his class and noted one of his paintings on the wall. I remarked, "John, you are really a clever boy." He responded, "Clever boy - clever boy - oh, yes, thank you."

In some instances, it is necessary for the clinician to present material at a slower rate. We have just begun to work with a four-year-old whose oral expressive language consists of unintelligible words. When he hears language he frequently tries to imitate what he hears but produces very poor approximations. Recently, the clinician has begun to modify her rate of speaking. She says words more slowly, and the child's productions are nearly perfect.

A third grade girl also has a problem with rate of speech. In class she was falling far behind and complained that her teacher talked too fast. The parents told their daughter she would just have to listen more carefully. However, the girl could not. At times she became so frustrated that she withdrew from class activities. Then she was referred for psychiatric study. The psychiatrist found no personality deviations, but he referred her for further study of a possible language disorder. Our evaluation revealed precisely what the child had already said - that is, people talked too fast for her. When sentences were repeated more slowly, she responded correctly. In a performance test of written language, she wrote sentences correctly when they were presented very slowly. On the other hand, when they were dictated normally she tended to reverse or transpose letters and to omit words.

A fifth input variable pertains to the quantity of input. As a rule, teachers tend to be highly verbal. They overload the child with too much speech. Here the complaint is that "teacher talks too much." Many tape recordings of teaching sessions reveal just that. The ratio of teacher-talk to child-talk is much too large. Moreover, some teachers bombard their students with questions so fast, that they have no time to answer. A five-year-old post-meningitic child expressed this point much better than I can. Near the end of one class period, he looked up at his teacher and said, "You know, you give me an Excedrin headache." Quantity of input had become a crucial variable for this child.

Quantity and rate also are critical variables when children are given group tests or group assignments. Some youngsters fail verbal portions of reading readiness tests, yet when carrier phrases are omitted, the children respond correctly to the items. Instead of saying, "Mark the furniture," the teacher merely says the single word, "furniture."

The sixth variable should be obvious, that is, level of difficulty. Whether the disability affects semantics, syntax, or phonology, level of difficulty must be considered. And we cannot present children with several tasks that are beyond their level. For example, we often see children with multiple problems; they may have difficulty with abstract words, with retrieval, with syntax, and with articulation. In planning lessons, it is important that specialists control variables so that the child is not confronted with many difficult elements of language. Often adult aphasics will say, "I can't think about both what I'm going to say and how I am going to say it." Similar responses are given by children. If the goal is to improve comprehension of abstract words, we can arrange tasks with a recognition or pointing response. If the goal is to improve a certain type of sentence construction, we will choose words we feel the child can say and retrieve easily.

A final point relates to the expected and desired response. As we work with children we must learn to select media to elicit certain types of responses. If we want to improve production and carry-over of a sound, we select pictures or experiences to elicit a response. Likewise, when working with children who have language disorders, we think about the expected response and select the input accordingly. If our goal is to improve comprehension of questions beginning with the word "where," we will have to arrange the experiences so a child begins to understand that a response begins with a word denoting location. If we are working on retrieval, the clinician must consider what words she wants to elicit and the type of input that will facilitate a response. In some instances the input for such a youngster may be a multiple choice question; in others, the initial sound is used; in still others, the printed word will aid the child.

In our efforts to systematize remediation we can utilize teacher-child interaction analysis techniques. Grids or matrices are used which have columns for input and output. Various classifications can be used for input. For example, one might include the words "objects, pictures, single words, phrases, sentences, questions." On the output side one might include response categories such as "no response, incorrect, confusion, gesture, single word, phrase, sentence." Each broad category can be sub-classified to include the various parts of speech or various types of sentences. These analyses can be used to study the performance of teacher and child, but they also can be used for lesson planning. As the teacher begins to consider the expected response, she can provide the most appropriate input.

In summary, I have tried to indicate that the clinician must study a wide range of auditory processes and investigate the affect of a disturbance on higher levels of learning. Also, I have suggested that not all children will learn in the same way. Therefore, the clinician must investigate the form and quantity of input stimulation that will facilitate learning for the child.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Johnson, Dr. Doris J.

1) Since auditory language is the base on which other symbol systems are built, is there a priority of skill acquisition in the numerous auditory processes for the child with a specific learning disability?

2) In teaching children to read (who do not have learning disabilities) would concentration on the development of skill in the various auditory processes be a more effective approach than some of those now in vogue?

3) What kinds of tests are being used to determine if a child is having difficulty with intrasensory stimulation, intensity, rate of imput, etc.? Are there standardized tests available? Is a psychological workup necessary?

A PSYCHOLOGIST'S VIEW OF LANGUAGE DEVELOPMENT AND THE READING PROCESS

DR. THOMAS G. BEVER

In recognition of his outstanding written contribution in the field of psycholinguistics, Dr. Bever was selected to participate in the National Institute of Child Health and Human Development Project "The Reading Process", an interdisiplinary attempt to resolve the nation-wide problem of reading retardation.

A PSYCHOLOGIST'S VIEW OF LANGUAGE DEVELOPMENT AND THE READING PROCESS

Dr. Thomas G. Bever

For many years linguistics as a theoretical and semi-theoretical discipline has provided a panoply of names for different pieces of language and for different levels. Psychologists and pedagogues have picked up on these names and have said, "If we call what we are doing teaching phonemes or teaching syllables, maybe we will understand better what we are doing." You can tell that I am skeptical about this, by the way I am introducing the problem. The candidates for the different kinds of structures that may be psychologically important are: phone, phoneme, syllable, word, phrase and sentence. When faced with this panoply of possible levels for the analysis of language, the first question the psychologist asks is: which of these is psychologically real? The linguist has confabulated an analysis of language to suit whatever purposes the linguist has. Now the question is, which of these particular kinds of structures are the ones really used by real human beings? There is a presumption that the kind of data that linguists use is, in some sense of the word, artificial. Well, it is not. The linguist considers what normal rules are, for sequencing sounds in English. If speaking or writing English is a human activity and the linguist is studying English then the linguist is studying a human activity. So, it is not immediately clear that these things are necessarily artificial. They are in some sense based on data, but we have to understand the limitations of the kinds of data they are based on, if we are to understand the limitations of the science.

One way of going to the data directly is simply to ask, in a laboratory context, which of these structures are real. The question might be stated like this: if you are going to examine psychological research about the nature of listening, is linguistics real? It seems to me, from the standpoint of studying the nature of reading, you have to ask is reading real?

The extent to which you can use the results of the sort I am going to describe, is constrained by the extent to which reading is in fact a function of listening. You may often be caught holding the assumption that the child knows how to listen. That is a helpful assumption, but the question remains open, with respect to reading skill as to whether it is liberated, once acquired, from the auditory functioning or it is not. That is a very difficult question, in the context of the general background, which is: What good is psychology if you are worried about reading and in what sense is reading a function of listening?

We remind ourselves that the alphabet we must learn to use is based on phonemes and segregates phonemes together with the words. The question is: Did whoever invented the alphabet do the right thing? And what can we do if he did not do the right thing? We already know that something is wrong or that there is a problem, but it is not clear whether there is any better way of doing it.

The kinds of experiments that have emerged in the last twenty years, and the kind of linguistics that have emerged emphasize the other aspects of the linguistic structure as linguistically and psychologically pertinent things: Phone, syllable, phrase, and more to the point, clause. If this is true, with respect to listening, that the most accessible linguistically defined levels are these, then we can understand the problem (in terms of the child's own knowledge of his or her skills; call it knowing how to listen). Given that we are trying to get the child to focus on aspects of linguistic structure which are psychologically subsidiary, though not necessarily psychologically unreal, the question is clarified if we can understand how, with respect to listening skills, the child extracts the concept of phoneme and the concept of the word. If we can understand this, we may be able to better understand how to instruct the child in the same sort of extraction procedure in the visual mode.

We turn first to adult psycholinguistics to put the work of children into context. The revolution of Chomsky sparked a great deal of excitement and a great deal of experimentation in the laboratory. The first was devoted to proving that the so called psychological reality of the linguistic structures that Chomsky and his associates had isolated, as potentially being real as far as linguistic analysis is concerned, was in fact really real.

Bever, Thomas G.

One of the most puzzling and controversial aspects of transformational grammar is the proposal that, underlying every actual or apparent sentence is an internal structure. This was philosophically anathema to a very strong school within psychology that has inherited traditional empiricism. Because, if you believe that sentences have internal structures that are, in some sense of the word, not there, (they are neither visible nor audible), it seems to me that you are claiming that there are internal structures in the mind that cannot be accounted for by known principles of learning or direct observation of the child's experience. The principal question is whether human beings contribute structure when they are born or they simply receive the structure as given. This focused attention on whether psychological support could be found for the proposal that underlying every sentence and every part of the sentence there is an internal abstract organization to support the structure.

A very simple technique is to look at the way in which listeners perceptually segregate the stream of speech as they hear it. For example, here are two sentences:

Harry Liked Bill. He wanted him to win.

If, in presenting these two sentences, we present interruptions (clicks, etc.,) at random, the report back, characteristically, is that the interruption noted by the listener is after the word, Bill. There are various elaborate procedures and experimental routines that one goes through to prove that this is not an artifact of having to report back the sentence but that it is truly an effect that occurs while listening to a sentence. This just says that all sentences are "kind of pulled together" by the ear or the auditory system. If we try to apply this technique to the proposal that sentences have internal organization, what do we find out? Consider the following two sentences:

Harry forced Bill to win. Harry wanted Bill to win.

For internal reasons within the linquistic analysis the linguistic organization assigned these two sentences differ at the internal structure level. Basically the difference is that in the case of "Harry wanted", Harry wanted the whole thing. In the case of "Harry forced", Bill was the recipient of Harry's forcing him to win. Bill was not the recipient of Harry's wanting him to win. In linguistic analysis, "Harry forced Bill", is one of the internal sentences and "Harry wanted" (something), in this instance, "Harry wanted Bill to win", is another. Simply take it as technical results of transformational theory that these two sentences differ in underlying organization, although their surface organization would seem not to differ at all. Characteristically, the place where the interruptions occur in these two sentences support the foregoing conclusions. So, we are left with this kind of evidence, that not only is the linguistic organization proposed here psychologically real but it is psychologically real in the technical sense of listening in a very special way. Its reality is expressed in certain types of activities that listeners carry out at certain points while they are scanning what they hear. This particular activity segregates the pieces of the sentence that correspond to sentences at the underlying structure level. The return mail from the laboratory to the linguist is that not only are they real but they are really real and they carry out a real function.

There are a number of physiologically measurable events that occur during listening. Listening is an activity carried out by the whole body, not by a disembodied ear attached to a grammar book. If, for example, we present something (click, etc.) that is hard to hear, rather than something that is easy to hear, it turns out that it is a lot harder to hear in "Harry wanted Bill to win", than it is in "Harry forced Bill to win", where the typically acoustic material surrounding it is exactly the same. Why should that be? One way of understanding the complexity of this, is that at this point in the internal structure the listener is busy computing, in some sense of the word, the meaning. He is computing an internal representation of what has been scanned on an auditory level up to that point. The listener is, in effect, temporarily turned inward, temporarily deaf, temporarily blind. Detecting a click that is near a threshold is a way of measuring temporary deafness. We have also looked at the detectability of different visual shapes presented when somebody is listening to a sentence and hears but is presented with a little triangle, square or circle and say what was seen - again as a function of the particular place within the internal syntactical organization of the sentence. We find the threshold for various kinds of visually presented figures higher and harder to discriminate. A great deal of what we see is blurry and a great deal of what a good reader does, among other things, is to have incorporated extremely intricate, clever, and bewildering eye movement patterns. When you are fixated on one word, you are making decisions. If you are reading about where to fixate next, you are making decisions based partly on the informational sphere, but also on the information that is very fuzzy about many factors. So, a great deal of the time the information that we use to make predictions about where to look is in fact often below threshold.

Returning to the laboratory, this sort of result accounts for the physiological material. If you present a click and you measure the evoked response of the brain to one ear, some number of miliseconds later the hemisphere on the opposite side of the brain will hear a little beep. If a click is presented at different points, manipulating the syntax, again, we find the same sort of effects. We could have predicted the same results, namely, a click presented at one point evokes a response to a lesser extent and with a greater delay than a click presented at another point. In reference to this, there is another important question, whether these effects exist or not depends entirely upon what the subject is called upon to do. If the subject is called upon to read the sentence or to listen to the sentence word by word and simply to say whether a click was present or not, or to say whether a particular word was present or not, then most of the effects that I have reported either go away or change drastically. The effects emerge when subjects are told to listen to sentences in order to understand them. These are not processes which simply occur because of the acoustic nature of what impinges on the ear. These are processes that occur because of the subject's efforts at comprehension. The level at which the listener is addressed determines the kind of perceptual processing that is carried out. These are relatively dry experiments carried out in relative purity and obscurity, primarily and initially addressed to the question of what aspects of linguistic theory are psycologically pertinent.

We find that one kind of study suggests that there is something special about sentences and particularly the internal structure of sentences as opposed to their external structure. Many sentences have complete coincidence between internal and external structure, e.g., "Harry likes Bill." A separate question is on a psychological level.

It is simply a question of how we segregate clauses. The answer is that one of the perceptual goals of listening to a sentence is to isolate one internal structure from another. It does not say how we do that. A plausible proposal is that we do it by identifying the words and putting those words together that make sense to put together. The way to test that is to do the following sort of experiment. Give eighty three-word monosyllabic sentences to a subject at the rate of about one per second. (Remember that the question we are asking is, do we listen to words first and put them into sentences or do we listen to sentences and maybe as part of the process articulate them into words). We find that the reaction time for the entire sentence is faster than the reaction time for listening for one word that begins the sentence. IT WOULD APPEAR THEN, THAT LISTENING FOR THE SENTENCE IS A MORE NATURAL WAY OF LISTENING THAN LISTENING FOR THE INITIAL WORD. We are not saying that words are not natural, but we are saying that they are in some sense derived from sentences, at least with respect to adult organizational listening behavior. A similar kind of experiment could be run to ask the question comparing syllables and phonemes. In our laboratory run of this experiment we consistently got the same results. Being instructed to listen for the first syllable is consistently faster than being instructed to listen for the first phoneme, thus supporting the argument that the syllable is the natural listening unit and the phoneme is derived from the syllable.

In the case of the adults, the lessons to draw are that it is useful and it may be necessary to draw distinctions sharply between linguistic knowledge and systems for managing speech. The system that I have talked about is listening. When studying a system, in this case, speech perception, one tries to explore which aspects of linguistic knowledge are, in fact, employed in that system and which are relatively subsidiary or not used at all. In addition, one tries to determine how those aspects of linguistic knowledge deployed are deployed.

Now let us turn to the development of the system of speech perception in the young child. We ran exactly the same sort of experiment with children. The way we do it with a child two and one-half to three years old is that the so-called sentences are now couched in terms of being little stories and the child has an enormous Jack-in-the-box with a great big red button. The child responds by banging the big red button and the Jack-in-the-box pops up. If the child bangs it at the wrong time nothing happens, so the child's goal is to listen for the story or for the story that begins with the word "boys." Again we find that sentence instructions are faster than listening for the first word.

This result with two and three year olds is very strong but it gets successively weaker and at the age of five it reverses. At age five, we have evidence that children are listening or interpreting the problem as one of focusing on words and not on sentences. That continues through ages six and seven, but begins to weaken until by eleven or twelve the reaction of children is back to normal, i.e., they are like two year olds and like twenty year olds. In between there is a period of focusing on the word rather than on the sentence. That presents us with a frightening problem. It is all very well to understand that the nature of speech perception has certain similarities between twenty year olds and two year olds, but that does not mean that there are similarities between either of them and a six or seven year old. That means that from the standpoint of solving the problems of the grade school teacher, we have work to do.

With reference to the kinds of things that children do, I would like to point out one more other aspect of perception that I think is important in this context and its development. How does one go about assigning the different semantic functions which words have within a sentence? I have argued that the sentence is a unit. I have argued that this is true, presumably, at the very beginnings of language comprehension. It is also true in the final stage. The question, then, is; given that the sentence is perceptually sound; given that we segregate pieces of sentences together, then what do we do to assign the meanings to the different functions of the pieces. The main question has to do with the distinctions between what is an actor in a sentence; what is the object and what is the action. Those are the three main semantic functions and the only one that is needed in addition to this series is the modifier. We have found evidence that a child, in listening, goes through a series of strategies for assigning the semantic functions that sentences have. Let us look at the sentence:

The horse kisses the cow.

Between ages two and six most children get sentences like this one right most of the time. It would appear, however, to be the case that they get the sentence right for different reasons at different ages. The fact that they get these sentences right is not an indication that they are processing them in the same way. In fact, there are counter-indications to that idea. For example, the two year old uses the following strategy: a noun preceding the verb is taken as the actor and anything left over is the object. So, the two year old, particularly, can do reasonably well on sentences like this. The strategy is essentially this: noun + verb = actor, action. The noun must precede the verb immediately. The noun does not precede the verb in the passive sentence; with the result that the child will perform 50% less well on that type of sentence.

Another way of testing that critically is by introducing nonsense words into the sentence. For example:

The horse bleggy kisses the cow.
The horse kisses the bleggy cow.
The horse kisses the cow bleggy.
etc.

We find that using the word, "bleggy", in this way kills the performance of the two year old. They drop from being near 100% on simple sentences, down to 50%. The introduction of the nonsense word does not bother the four year olds at all. One way of interpreting what the four year olds do is to say that the four year olds have simplified what we view as a perceptual gestalt. They are now listening and taking the first noun in any sequence as the actor, hence, wrong performance on the passive, right performance on the active, whether the words come out or not. We do not know what happens between four and six. But, what happens in terms of characterizing it, is, that a child acquires mastery over when to use which of these strategies. We can show, experimentally, that adults use these strategies as well.

Let us turn, now, to the topic of cerebral dominance. There is rather strong evidence, both in adults and developmentally, that the kinds of strategies I've been discussing, (perceptual segregation strategies, segmentation strategies and strategies that assign semantic functions), are asymmetrically represented. In the case of adults, we get stronger evidence, in the laboratory, when the stimuli is presented to the right ear than when the stimuli is presented to the left ear. Among children, we find that those who demonstrate capacities to use the kinds of listening strategies enumerated above, are those who have developed very strong cerebral dominance. In those children who show a strong ear-hand coordination, generally for the right ear and right hand, we find the capacity to get active sentences right all the time, but they have a hard time with passive sentences. In the context of our questions, there is an ontogenetic suggestion. The suggestion is as follows: between the emergence of these simplified strategies for listening and the emergence of cerebral dominance these listening strategies are learned, repetitive perceptual patterns. Thus they become associated with the dominant hemisphere which, for other reasons, perhaps genetic or not, has become the residence for linguistic knowledge.

The final point I want to return to, is the way in which we view listening and listening patterns somehow central to what goes on in reading. The attendant view is that when you teach a child to read you are teaching him to map into the already learned auditory system of perception. You are teaching the child how to plug in the visual form of the stimulus. Once you plug in at some level of analysis, the auditory habits and auditory base for them take over for perception. One of the things I have tried to emphasize is that a four, five or six year old child is by no means finished with the development of listening skills. The process of learning to read, itself, has effects on how we go about listening. The age at which the normal child learns to read, and perhaps the developmental age at which any child learns to read, is an age at which the ontogenesis for the perceptual system for spoken language is still under way. Between the ages of eight and eighteen the learning of reading skills and of listening skills continually interact on each other. In addition, at this age there is extended development of the perceptual system itself. Related to all of this, is the fact that there are also purely visual movements in reading that have no listening equivalents that we know of. For example, we know that good eye movement patterns are somehow related to good reading.

In the case of language it would seem that the alphabet and the word and the way of organizing things visually is not the most conspicuous way of finding relationships between the visual and auditory. The more perspicuous way would be to have a "syllabary" or a "sentencery" whatever that would be. The problem with "syllabaries" and "sentenceries" is that there are too many syllables and too many sentences. We are all familiar with the problems that arise with that situation. However, understanding it in this way does make it possible for us to ask this question: given, that we understand the problem in this, what would change? We would have two basic choices: you either change the child or you change the alphabet. For certain children, especially for handicapped children, it may well be that changing the alphabet does have intrinsic limits but it may also be much easier to read. These are special children and it is not clear that the latitude which is given to change them is enough. It may be that changing the alphabet is exactly the right move to make.

In the case of normal children, those without any obvious special problems, many of them learn to read when given the opportunity and devoted instruction. So, it can be done. The question is, do we understand the problem as one of trying to get the child to understand about phonemes. I think that has been understood as a problem for a long time. But we must further understand the problem as getting the child to understand that there is such a thing as a word, because linguistic sophistication is assumed by the way in which the alphabet and writing is presented. We have to make sure that the child has acquired that kind of linguistic sophistication about his own capacities.

I think that the only way to utilize the various scattered laboratory results is to try to use them to figure out what type of problem the child faces, to try to determine the nature of the problem, and how to help the child solve it.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Bever, Dr. Thomas G.

1) Considering what Dr. Bever says about the relationship between cerebral dominance and reading skill, what adjustments must be made in reading readiness programs for normal as well as handicapped students (e.g., should reading teachers concentrate on eye - ear - hand coordination?)

2) Current research indicates that speech perception of 5 to 11 year olds differs from younger and older age groups. They respond faster to listening for sentences rather than for first words. What effect does this have on our current methods of reading instruction?

LANGUAGE ACQUISITION DEVELOPMENT AND THERAPY

DR. LOIS BLOOM

Dr. Lois Bloom author of "Pivotal Grammar" and "One Word At A Time" has discovered some new and interesting theories about language development and has been duly recognized for her contributions to the field of linguistics and of psychology. She is presently engaged in interdisciplinary research in the Departments of Speech Pathology and Psychology at Teachers College, Columbia University.

LANGUAGE ACQUISITION, DEVELOPMENT AND THERAPY

Dr. Lois Bloom

My research has to do with very young children's language. I studied children who were less than three years of age. My data begins when children are still only using single words and continue until they are three years of age. I want to say right off that I don't know how children learn to talk. I don't know how children learn to read, but, I don't think anybody else does, either. That is a certain amount of comfort. In the last ten years much has been done to cast a great deal of light on eventually answering questions such as how children learn to speak and how children learn to read. If the endeavors of the 1960's are any indication, we should have even more insight and more information in the 1970's.

I am going to be talking about children's early grammar; about their first sentences in relation to how they interact in their environments; how they interact with the objects, events and relationships around them and how these relate to their cognitive development, that is going on at the same time. I am going to raise certain issues about the nature of language, generally, and the relation between language and thought, and I believe that what I am going to say does have relevance for linguistic learning. Linguistic learning obviously takes in learning to read and learning to talk and learning to talk where there's a difficulty in learning to talk for some reason or other. The children that I have studied have all been essentially the same kind of child. There are five of them. They are white; they are upper middle class; they come from parents who have attended college; they have all been first-born children, so it is a restricted population. It turns out that most of what has been done in the last ten years with respect to early language development has to do with the same population, but we feel that there is a commonality among all children in learning language. The one thing that has come out of research with just this limited population, that is so restricted in the ways that I have just told you, is that in addition to this commonality among all children learning language, there are extremely important individual differences even among children in the same social, cultural, intellectual melieu.

I am going to begin by presenting an overview of language development research that is going to be familiar ground for all of you. I am going to do it in order to place my own research in prospective, so you will have some idea why I think what I have to say or have been saying, is somewhat different. Up through the 1950's, people who were looking at children's language and language development, were describing the form of children's speech. They were intent on establishing developmental norms. They were intent on saying something about as many children as possible and so they wanted to say something about large numbers of children and necessarily they were forced to say relatively little about their speech. The research that was summarized in McCarthy's chapter in 1954 has to do with certain descriptions of superficial features of children's speech, i.e., such things as the number of words they used; the length of their utterance; the different kinds of words, such as nouns, pronouns, prepositions, adjectives, verbs, etc.; the kinds of sentences they used in terms of simple, compound and complex sentences. When children's language is described in terms of form, there are two essential alternatives, and it seems to me that you can go back and look at the research up through the 1950's (and some of the research, by the way, that has continued through the present time,) and see that one or the other of these alternatives was the guiding principle. On the one hand, people were intent on describing developmental milestones. They wanted to determine the milestones for language development so that they could compare children with different experiences, different backgrounds, different problems. Alternatively, they described children's language in terms of the adult model. The developmental milestone approach attempts to be child centered. It attempts to say something about child language and child development and language development. Describing children's language in terms of the adult model is more adult centered. When you consider the developmental milestones, most of you know, that children come out screaming initially; during the first year of life they produce a great deal of sound that varies in certain systematic ways; at the end of the first year, they begin to produce things that sound like words, or that are at least recognized as words by people in their environment. Between the first and the second year they continue to say more and different words, and sometimes towards the end of the second year they begin to combine two and three words together. By the time most children are twenty four months of age, plus or minus several months, they are producing sentences that consist of a subject, a verb and an object, and by the time they are three years old, their sentences are more complex. Obviously there are a lot of unanswered questions about the developmental milestones. For example, we don't know what the child knows at any particular point once we've described his speech in this way. We don't know what words occur, and why those words occur. We don't know what phrases occur and why those phrases occur at the end of the second year. Perhaps even more important, we have no insight into how the words that occur in the beginning of the second year and the phrases that occur in the beginning of the third year are interrelated. So essentially looking at developmental milestones gives us a very inadequate base for a theory of language development. We don't know how the child learns or develops, we don't know what he learns and we can't explain the process of transition from one milestone to another. Essentially, perhaps the most important shortcoming in describing speech in terms of developmental milestones, is that it ignores the notion of development as essential change over time. We know, for example, that children who are saying only one word at a time, can be saying only one word at a time for a long time. We know now that it is a period of considerable developmental change. The child of thirteen or fourteen or fifteen months is saying only one word at a time and he is not about to use syntax; he is not about to say longer utterances. The child of eighteen or nineteen months is still saying only one word at a time. He is about to use syntax. He is about to produce two or three utterances together. What is the difference between them? What is the difference between the kinds of words they use and the way in which those words are used so that we can understand what explains the transition from using only one word at a time to combining two and three words together. We also know that the early two word utterances are directly related from the beginning not only to the single words that have come before, but also to the subsequent three, four and five word sentences. So, just describing children's speech in terms of the length of their utterances, their developmental milestones, ignores the process of change within a milestone. Within a particular "milestone" there are enormous differences and variations that are critically important for explaining progress through a developmental milestone.

The second point is, that description of sentences in terms of the adult model, has essentially two major shortcomings. The first is that the criteria of productivity are essentially ignored when one takes an utterance in a child's speech and compares it with an utterance in adult speech. If an adult says a sentence and another adult who speaks that same language accepts that sentence, he is saying in essence, "I accept that sentence as a sentence appropriate in my language. I understand it. I know that it is grammatical." The single occurence of that sentence is enough to warrant including it in a grammar of that language, primarily because, and really only because, it is possible to get other kinds of information from adults. We can ask adults about their sentences. We can ask them about what they know. We can ask them to paraphrase their sentences. We can ask them to resolve questions of ambiguity. Obviously, we cannot tap children's intuition in the same way. We cannot ask children to tell us what they know about their language. We cannot say to a child who says something like, "Mommy's sock," to tell us what that means. We cannot say, "How does Mommy's sock one differ from Mommy's sock two?" or, "Why did you say "Mommy's pigtail?" However, what we can do is look for other kinds of evidence and the kinds of evidence that I have looked for in my research is repeated occurence of a particular structure with different situations. So, I am saying, essentially, that the single occurence of a structure is not enough evidence for saying that the child does indeed have knowledge of that structure in his underlying rule system, i.e., in his internal mental grammar that allows him to speak and understand sentences. So the first shortcoming in describing children's sentences in terms of adult sentence types is that the criteria for productivity are simply not there if you are satisfied with a single utterance that sounds like an adult utterance.

The second reason is a more serious limitation and it is one that I hope you are going to think about because I think that it has considerable relevance for language development after the ages of three and four. When a child talks, what he says is related very directly to what is going on around him. As Roger Brown has put it, "Young children speak in the here and now." If I came into this room and I picked up my handerchief and said, "Handkerchief," "Blow my nose," Scratch my head," you would think that I was a little bit strange. That is exactly how little children talk. Go on any playground. Go in any Day Care Center. Go in any home where there is a two or three year old child around and you will see a child go over a tricycle and say, "My tricycle." Children talk about what they see and about what they do in a way that adults do not. You and I are talking right now and you are not dependent for understanding me on anything around me and I am not dependent on what I see in front of me, for what I say. Yet, you are not having any difficulty understanding me and I am not having any difficulty in saying the sentences that I am saying. What I am saying and what you are hearing is independent of the context in which it occurs. This is not true of child speech. It is not true of child speech for two and three year olds. Child speech and child understanding are very much dependent on the support of situational and behavorial context. If that is true, if the child's utterance needs the support of what is going on around him, then the same utterance in the speech of the child and in the speech of the adult could not be obtained from the same underlying knowledge. There has to be a difference in the kinds of things that adults and children know. The rules cannot be the same. They cannot be the same processes for speaking and understanding sentences. What children say and understand depends on the support of situations and behavior around them; this is not true for adults. People began to realize this difference toward the end of the 1950's and into the 1960's, and began to ask deeper questions. They began to go beyond the superficial form of children's speech and to try to come up with an account of what the child knows, i.e., what the underlying knowledge is; what is in the child's head to make it possible for him to be able to speak and understand utterances that have the form that they do; what is the knowledge of language that underlies surface form. Once these deeper questions were raised at the end of the 1950's, people began to be satisfied with saying something about fewer numbers of children. People began to ask questions that required a much larger data base and different kinds of information that could not be obtained from hundreds of children. This could only be obtained from a small population of children. Essentially, this change in research in child language, research in language development, corresponded to an important change in linguistic theory. In 1957, Naom Chomsky burst upon the scene out of MIT and introduced a theory of linguistics that quite literally revolutionized how people looked at language and how people looked at grammars of language and so the study of language development and the study of child language became in transformational terms (in Chomskian terms), a search for grammar. People began to look for generative grammars of child speech. Once people tried to do this, once people began to collect samples of children's language and attempted to say something about their grammar, it became apparent that one could say something about the form of children's speech again. However, in order to explain what children know that accounts for what they say and what they understand, it was necessary to look at the conceptual underpinnings of language; to look at what children know about the world in general in order to know what children know about language. So, essentially, it raised the issue of cognitive development as it related to language development. It became clear that language does not have a one-to-one mapping or relationship with the world. It is not the case that words and sentences and phrases have a one-to-one matching or mapping or coding with objects, events and relations in the world. Rather, language has a mapping or a coding of an individual's representation of events in the world, i.e., what the individual understands about the objects, events and relations in the world around him determines what he knows about language. Language is a coding; it is a mapping of an underlying perceptual, cognitive representation of experience. It is this intervening perceptual, cognitive representation of experience that is coded by language. So it is not the case that we learn language by matching words or phrases or sentences with objects, relations or events in the real world. Rather, it is the case that we interact in the world in certain specifiable ways and that interaction in the world allows us to perceive, to organize, to come to terms with, cognitively, the objects, events and relations that recur with great frequency in the world around us. It is that knowledge, that representation, that is coded by language. With this interpretation, the study of child language turned away from linguistics and turned toward cognitive theory. Interestingly, this occurred at the same time as another important change in the field of linguistics. By the end of the 1960's, Chomskians, generativists, transformationalists, whatever you want to call them, split into a number of different camps, because it became obvious that language did not exist all by itself, apart from anything else in the world. It became obvious that one could not describe language as an abstract entity that existed apart from anything else in experience. In 1968, Naom Chomsky began referring to himself as a cognitive psychologist and began referring to linguistics as a branch of cognitive psychology. So essentially, what happened is that research in the 1960's started out being very much influenced by Naom Chomsky and transformational grammar, but it ended up at the start of 1970's by being much more influenced by people like Jean Piaget, Hans Werner and Bernard Kaplan. People began turning to cognitive psychologists, particularly Piaget, in an attempt to explain underlying knowledge which includes what people know about language and what people know about the world.

My research is in that transition. Essentially, it started out being very much influenced by Chomsky and by transformational grammar and what my research essentially did was to reveal to me what I have just revealed to you - that it is this cognitive perceptual awareness that needs to be accounted for, that needs to be described and explained if one wants to account for how children learn to talk and what they learn at any step along the way.

Let me tell you something about the kind of data that I collected and why I collected it. To begin with, the studies in the early 1960's were done in three different places, i.e., the major studies in the early 1960's to which my research bears direct reference. Roger Brown, and his colleagues at Harvard University, did a study of three children, Adam, Eve and Sarah. W. Miller and Susan Errigan did a study out on the west coast at Berkley of five children and Martin Braine did a study of three children at Walter Reed Army Medical Center where he was (he's now at New York University). Three different studies in three widely different places, all had the same goal in mind. The researchers wanted to be able to write transformational, generative grammars of child speech. So, they focused on the children's emerging grammars. They wanted to be able to explain the underlying grammar, i.e., the underlying rule system that accounts for children's sentences. They wanted to explain it from the beginning and so they decided to see these children at the beginning of the phrase period when they were beginning to put two and three words together. They visited them in their homes, collected large samples of their speech and attempted to propose rules of grammar that would account for the speech that they had attained.

If one wants to say something about children's grammar, about children's sentences, there are at least three alternative operating assumptions. One of these is that the child's sentences or phrases will be essentially incoherent, will be unpredictable, will be non-systematic. A lot of people believe that children learn to talk by a process of trial and error; that children make a lot of trials and make a lot of errors and that they make more errors than accurate responses. To many people child language is a chaotic non-language that misses the mark more often than not. Fortunately this was not the operating assumption of people to whom I have just referred. Rather there were other original operating assumptions, the first being that child language is not incoherent, is not unpredictable, is not chaotic. It is most probably systematic and predictable, but potentially idiosyncratic. It is idiosyncratic in that although predictable, although systematic, although coherent, it nevertheless is a different system from the adult model in at least two possible ways. On the one hand, each child develops his own system; each child interacts in his environment with the speech that he hears and comes up with a predictable coherent system - rules for understanding and speaking sentences that would be different from any other child. Or alternatively, all children come up with the same child system - that there is truly a "child language" like there is German, French, Japanese, Chinese, English -- there is "child language" for each of these languages. It is the same for all children. So, people in the '60's would either study individual children, in an attempt to look for evidence of idiosyncratic systems or they would look at the speech of a number of children - two or three children together - attempting to say something about child language in general. The third operating assumption (the first is that it is incoherent; the second is that it is systematic and predictable but idiosyncratic in at least two ways), is that child speech is a systematic reduction of the adult model. The child's language is more like the model than it is different, therefore not really idiosyncratic. The research I mentioned earlier, that describes child language in these terms, took this as an original operating assumption. Although the studies by Brown, Braine, Miller and Irvin did not take the same view, it turns out that this was essentially the result of research in the 1960's - that child language is systematic, that it is coherent; that it is predictable, i.e., knowing about one part of the child's system allows you to make predictions about another part of the child's system, and that it is also more like the adult model than it is different. It is not a different exotic language.

The goal of the research of the 1960's was generative. Researchers wanted to know the rule system that underlies the children's utterances; that accounts for the fact that they are able to speak and understand sentences. Essentially what was done was to use linguistic methodology of an earlier period. An analysis was made of the children's speech that was distributional. The studies by Brown, Braine, Miller and Irvin indicated that they took a large sample of children's speech. They wrote down the two word utterances and they looked for evidence of distributional regularity. They looked at the way different words in the children's speech were distributed across the entire body of utterance. They found that there are a small number of words that occur in child's speech very, very frequently. Words like "No," "More," "This," "Mommy," occur with great frequency. Moreover, they occur in fixed position, i.e., "No" always occurred as the first word of the phrase. "This" always occurred as the first word in a phrase.

The major resolve of research in language development in the 1960's was that the earliest sentences of children are distributionally predictable, i.e., there are a small number of words that occur with great frequency in fixed position relative to a larger number of words, each of which occurs infrequently; that larger number of words includes cottage cheese, pigtail, truck, chair, dirty, soap, etc. This distributional phenomenon has been replicated a number of times. There have been a number of studies of children in the same period (that period just after the emergence of two and three utterances in different languages) and this same predictable distribution occurs in their speech. The first substantiation came when Dan Slobin looked at the diary studies of Russian speaking children that were done earlier in this century in Russia. The reason why Russian was interesting is that Russian is not a word order language. It doesn't depend on word order for signaling or semantic relationship; rather it depends on inflectional endings. In Russian he found the same distributional occurrence.

When I started my study, I asked several questions: Is this account of child's speech, this description of the distribution of different words, unrelated to the child's subsequent sentences and to the adult model? Essentially, this kind of analysis just describes the surface features of the children's speech. It is again a description of the form of their utterances, i.e., the kinds of words and the ways in which those words occur in combination with other words. However, the notion of sentence structure, what sentence structure is all about, has to do with the relationship between words in an utterance. A SENTENCE IS NOT A SUM OF THE MEANING OF THE WORDS IT CONTAINS. THE MEANING OF THE SENTENCE IS DERIVED FROM THE INTERRELATIONSHIP AMONG THE WORDS IN THE SENTENCE. It does not depend on a simple addition of the meaning of the words. The nature of structure is relationship and no one had said anything about the relationship between the two word utterances that occurred and indeed that there were different relational meanings. For example, in this data from Kathryn, when she said, "No sock," she was not able to find a sock she was looking for. When she said, "No fit," she was unable to fit two pieces of puzzle together. The sock did not exist, the fit did not occur. However, the situation when she said, "Dirty soap," was different. When she said, "No dirty soap," she was in the bathtub; there was a sliver of old worn soap lying on the edge of the bathtub and a brand new bar of pink soap and Kathryn did not want to be washed with the old soap. She wanted to be washed with the pink soap and so she pushed the old soap away and said, "No dirty soap." But, the dirty soap was there. Do you see the important difference? In one situation the soap is there. In the other situation the sock was not there. The form of the utterance is the same. In both instances the child said, "No," plus something else - the same form, yet a different relationship between the constituents. So, it is not enough, simply, to describe the form of speech in this way; to say how words are distributed relative to one another. If you want to say something about the structure that children are learning, it is necessary to look at the relationship between the words that actually occur in two-word utterances. Once you describe children's speech in this way, it is necessary to explain the distribution. Why is it that certain words occur more than other words? Why is it that children say words like "No more of this, Mommy?" What explains the difference? What is the source of the distribution? Clearly, the explanation of why these kinds of sentences occur; why certain words are used more often than other words has to do with what the children are talking about - how children use their language relative to the non-linguistic state of affairs to which their language refers.

How does one know the meaning of the child's utterance? It is true that we do not know exactly what a child means by what he says, but it is also true that children talk about what is immediately around them; they talk about what they see and what they do. If you are there, you can hear what they say relative to what they see and what they do. So, the only claim that is being made for getting at the semantic intention of the child, is that when a child picks up Mommy's sock and says, "Mommy's sock," that utterance with that form, "Mommy's sock," is related to that object which does, indeed, happen to be Mommy's sock and not Katherine's sock and not a piece of paper or a chair. The only claim that is being made is that children talk about what is immediately there and some judgment can be made about their semantic intention based on the relationship between what they say and what they are talking about. So, when we are talking about meaning, we are talking about what children are talking about.

This kind of analysis that attempts to account for the meaning relationship between words has been termed by Roger Brown as "rich interpretation." He has said that this is essentially a "rich interpretation of utterances," i.e., you say something more about what the child says than what you actually hear. Everybody does "rich interpretation," now. Studies of children's one-word speech, and I have just completed a study of one-word speech, have been much more liberal in attributing rich interpretive meanings to the children's utterances than I have. In my study I am much more restrained in saying what I think a child means when a child says only one word at a time, but there are other people who are making much stronger claims about the meaning of one-word utterances. I am much more conservative than most people are. I am much more eager to rely on available evidence and to look at the actual utterance that occurs in addition in certain specifiable ways to the situation in which it occurs. Essentially, what I came up with, was an account of the children's sentences in terms of the underlying relationships between the words. It turns out that when this is done, there are only a small number of conceptual relations being coded in their speech. There are not a great number. The three children that I studied initially (I've added two more children to that population) talk about the same kinds of things. This analysis was made in 1968. All of the research in the 1960's, the research that Roger Brown has brought together in an attempt to define the semantic relationships between words, has to do with a population of children that is less than thirty. It has taken twelve years to find this out about these thirty children.

In my study I looked for children who were about to use syntax; were using single word utterances or just about to use two-word utterances; who were first born children of college educated parents (because I wanted to be sure that they were going to learn to talk). They all lived in one apartment house because I wanted to know them very well (it was the apartment house in which I live).

Essentially, there is a concurrence in the literature now. What Roger Brown is saying in his new book is that early sentences can be characterized in terms of meaning relationships between words and that there is a small number of meaning relationships. He has called this Stage One Speech. The meaning relationships are: _Functional_ relationships between words, (this is where the child seems to be specifying the existence of something); _nonexistence_ terms, e.g., no sock, no pocket, where something does not exist in the context; _disappearance_, where something ceases to exist after it has already existed in the context and finally, _recurrence_. So, all of these children (the five children I studied and the twenty-plus children that Roger Brown has looked at in his literature) combine words like "no," "more," "this," "that," with other words to specify the notions of existence, nonexistence, disappearance and recurrence. These are all _functional relations_.

The others are _grammatical relations_. They essentially have to do with the relationship between verb-objects; action-object; age-action and age-object. It is important that you understand why other relationships did not occur. For example, there are some really notable omissions in this list. None of these children (in all of these thousands of utterances from these twenty-plus children) produced the data relation, i.e., giving something to somebody. Yet this is something that occurs all the time around the child - showing something to somebody. That is the child did not say, "Mommy, picture," when she gave Mommy the picture. The data relation was not coded in these early utterances. Many relations did not occur, which means that the children where talking about what they knew about. It is not the case that their utterances simply reflected or mirrored relationships in the world around them. They were only referring to or talking about relationships relevant to what they knew about the world. After the fact, once you look at this, you are really impressed with how obvious this is. What else would children talk about? If you look at what Piaget has to say about the development of sensory-motor intelligence in the first two years of life, this is essentially what it is all about. That is what children are doing in the first two years of life. They are learning that objects exist and endure and have independent endurance and existence apart from themselves, apart from their actions; that objects disappear and objects come back; that they can do things to the objects; that they can locate the objects. It turns out that when the child begins to produce two-word utterances this is exactly what he is talking about.

The study of single word utterances that I have just completed was motivated by some claims by David McNeil and Naom Chomsky, that language is innate and that a child in the single-word utterance period already knows about sentences; already knows about grammar. That's nonsense. Essentially, the point of my study was to demonstrate that children who say only one word at a time, in the second year of life (from first words at about twelve months to phrases in the second year) know nothing about syntax; nothing about grammar. They know a great deal about the world. They know an awful lot and they learn more and more about objects and relations among objects and events in their experience, but they do not know grammar. They do not say sentences primarily because they do not know syntax. The data I have indicates the sequence in which these kinds of conceptual notions begin to be referred to, begin to be manifested in children's one-word speech.

It is important that you understand that it is not the case that children are learning a dictionary of lexical items of noun-like words. The single-word utterance period is not simply a period in which children acquire a noun vocabulary. Rather, the first kinds of words that occur and endure in children's speech are person names, each of which has a unique class of one, e.g., there is only one "Mommy" for the child; there is only one "Daddy" for the child. It is important that you understand that person names at this period differ radically from object names. Person names come early and they endure in this period of time. Once a child begins to use person names, he continues to use them. Function words come in and they endure, i.e., virtually all of these children have some kind of a demonstrative. They say "uh" or "this" or "that," or "what's that?" Other function words are, "all gone," "stop." These function words are very different from person names and very different from object names because they refer across classes of objects and across different kinds of events. For example, you can use the word "this" and refer to "this machine," "this table," "this paper." You can use the words, "all gone," after you've eaten potatoes, meat, spinach, cookie. All of these different kinds of things can be "all gone." Object words are different. Object nouns (these include verbs, also) are different because the child has to know eventually that the word "chair" can refer to this chair which is different in form (perceptual shape) from that chair and that chair. It turns out that these are the words that are learned last in the single-word utterance period. Learning words like this depends upon the child's knowing about objects, knowing about the permanency of objects and endurance of objects apart from himself and his actions on objects. So, in respect to an order in which these notions occur in the single-word utterance period, there really is no logical order. Let me add, also that even though we can identify these in single words, and we can identify them in phrases, it is not necessary for the child to use the word or use the phrase to have the underlying conceptual notion. The child does not have to say the word, "this," or "that," or "book," to have the notion of existence. He does not have to say the word, "more" to understand that things "come back."

The "order" that most people agree on at this point is the following: 1) functional relations; 2) subject-verb, verb-object and subject-object (either one or the other of these can predominate in the speech of different children); 3) locative (location of objects) and 4) possession. Attribution comes later.

I was a speech therapist and I know that when I was doing speech therapy with a child who was nonverbal or with a child who was beginning to use words or with aphasics who only used one word at a time, essentially what I was doing was saying, "book," "ball" and then I was teaching "red book," "big ball," "little ball," and "red apple," "apples," or "books." The point is, this is not the way normal development proceeds. The distinctions within a class of objects with respect to relative size or color or number is less important in normal development than these other distinctions. Children are simply not talking first about red books as opposed to blue books or big balls as opposed to little balls. They may know a ball as a big ball and they may call it a big ball but they are not calling it a big ball based on some judgment they have made of that ball relative to the class of balls, e.g., bigness versus smallness. When I say that treating children with language disorders should follow a developmental sequence, I believe it very, very strongly. I know that there are people who argue whether or not you can use a normal model of language development for teaching children with language disorders. I believe there is nothing else that you can do for a number of very important reasons. The first reason is that the nature of language, as I understand it, is a system and what that means is that any one part of the system has important consequences for another part; that language involves a system of priorities. You do not go into language at the top but that rather the relationships between words depend on other relationships between words and learning one part of a system necessarily involves an understanding of another part of the system. There are important sequences of linguistic priorities within the system. The second point is that if you do not use a normal model of language development, the only other model you have is your own intuitive sense of simplicity - simplicity versus complexity. And it turns out that for adults, the simplest structure in the language is the noun phrase - a determiner and a noun, or an adjective and a noun or a noun with an "s" at the end of it. That is not the simplest in child's speech. So the criterion you are going to use if you do not use a normal developmental model is necessarily based on your own adult intuitions about simplicity. I think that a stronger basis to use for treating children with language disorders or teaching language is that system of priorities that have been found best in normal language development.

What happens after this is that SVO (subject-verb-object) begins to be combined and the step after that is that each of these begin to be embedded in the object-phrase. The child will say, "Eat baby cookie." (Eat the cookie that belongs to the baby"). Usually at the same time that he does this, he drops the subject of the sentence.

This information, I know, needs to be applied so that it can be used for treating children with language disorders and for saying something about how children learn to read. With respect to reading, let me say, that I think that people are going at it all wrong. It seems to me that people are teaching children to read by teaching them the forms of sentences and emphasizing auditory and visual sequencing which the children begin to recognize. I think people need to think more about the relationship between words.

With respect to teaching children with language disorders, my feeling today is that no matter what the cause of the disorder is, there are two basic things that have to be kept in mind. The first is that whether the language of the child is delayed or disturbed, the most reasonable and practical hypothoses for beginning treatment are to be derived from normal language development. Importantly, the model of language development that is used for application in both evaluation and treatment should be essentially a cognitive, linguistic model. Learning or developing language depends upon prior conceptual representation. There are certain semantic intentions which underly children's utterances. These recur with great frequency. The same semantic relations underly a great many different utterances but they originate in the child's experiences. What the child learns about language depends upon his organization, his perception and his organization of the world around him. The second point is that a program for treating language disorders has to have three parts: 1) a consideration of form; 2) the underlying cognitive meaning and 3) the function of that utterance for the child.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Bloom, Dr. Doris

1) Is there any evidence to support the theory that the student's ability to think in terms of the relationship between words (as he reads) is directly related to his experiential background?

2) Where does a teacher start on the scale of "normal language development" to help the student with a language disorder?

TRENDS IN READING

MRS. DOROTHY SPAR

Currently, Mrs. Spar is Director of Reading Instruction for District 27, New York City. Her lecture tours have taken her to all parts of the United States including Hawaii.

TRENDS IN READING

Dorothy Spar

In 1955 with the publication of Rudolph Flesch's WHY JOHNNY CAN'T READ, the newest revolution in reading theory exploded. With the advent of Sputnik, and in 1957 with Noam Chomsky, the classroom teacher was faulted increasingly for the poor showing of American school children. The introduction from England, in 1964, of the ITA (which used forty-four symbols to represent the major sounds of English) represented another trend. In 1967 the debate continued with the publication of Dr. Jean Chall's LEARNING TO READ: THE GREAT DEBATE in which she concluded that the whole word concept was the culprit and "should be replaced with the phonic approach." This, Chall called the code-emphasis approach. In all of these publications, phonics was again the recommendation.

The classroom teacher has always used more than one "attack" in the teaching of reading. In recent years, the introduction of new auditory and visual electronic equipment has made possible the development of greater individualization in the reading program. Along with this development more specific differential diagnosis is being carried out, followed by diagnostic-prescriptive instruction.

The appearance of the classroom is changing. The separation of teacher, student, reading specialist and paraprofessional is no longer as apparent as before and the responsibility for learning to read is being shared by all of those who come into contact with the child. The old static form of instruction is disappearing and is being replaced by many of the programmed materials which have been developed. The reading program in today's schools represents an integral part of the child's total experience.

TRENDS IN READING PROGRAMS IN NEW YORK CITY ELEMENTARY AND J.H.S.

The reading programs in the elementary and junior high schools are charactarized by considerable diversity. Within this diversity, however, the following significant trends in reading instruction are observable.

I Recognition of Reading as One Facet of Total Language Development

Emphasis on oral language development in prekindergarten and kindergarten as an important aspect of reading readiness

Increased time and instruction given during the reading period to the improvement of listening and oral reading skills

Recognition of the similarity of the comprehension skills involved in listening to those involved in reading

Greater perception of the effect of nonstandard speech patterns on oral reading and comprehension

Increase in the use of linguistic readers for beginning instruction

More frequent use of textbooks which correlate activities in listening, speaking, oral and silent reading, and writing

Utilization of pupils' written expression as appropriate material for a reading activity

II Heightened Interest in Diagnosis

Search for and use of tests which help to diagnose a pupil's reading problem

Training of reading staffs in the administration and interpretation of diagnostic tests

Establishment of diagnostic centers in schools and districts

Involvement of psychologists, physicians, and other interdisciplinary specialists in the diagnostic process

Heightened Interest in Diagnosis (continued)

Growing recognition of the dangers of using such labels as dyslexic without sufficient evidence

Recognition of the importance of fitting methods and materials to needs established by diagnosis

III Diversification of Methods and Materials Within One School

Use of various types of basal readers: readers which stress early and vigorous phonic instruction; readers which stress consistency of sound-letter relationships and/or sentence patterns; readers which stress literary selections; readers and trade books which reflect multi-ethnic, multicultural, multi-locational situations and experiences

Use of reading materials which are programmed or individually prescribed and, therefore, are self-pacing and self-checking

Use of paperbacks and of kits containing short selections on cards

Use of materials that are correlated with cassettes, filmstrips, records

Use of instructional hardware as an important tool; e.g., controlled readers, "talking" typewriters, computer-assisted programs

IV Increased Individualization of Instruction

Extension of programmed and individually prescribed instruction

Decrease in pupil-adult ratio in reading situations through use of additional staff members, of community personnel, and of pupil tutors

Renewed efforts to discover pupil interests and to involve the pupil in planning and evaluating reading activities

Increased Individualization of Instruction (continued)

Greater attention to pupil learning styles, resulting in the individualization of methods and materials.

Prepared by the
Bureau of English

Submitted by:
Dorothy A. Spar,
Director of State Urban Education
District 27, N.Y.C.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Spar, Dr. Dorothy

1) What methodology has been developed to help the student with nonstandard speech patterns to perceive the relationship of his speech to his ability to read and comprehend?

2) How can linquistic readers be more effectively utilized to teaching the beginning reader?

LANGUAGE AND READING

DR. VIVIAN M. HORNER

Dr. Horner is Director of Research for THE ELECTRIC COMPANY, a production of the Children's Television Workshop. She was formerly a researcher in Verbal Behavior at the Brittanica Center for Studies and Learning, Palo Alto, California. As a psycholinguist she has presented papers at The Center for Urban Education, at The American Psychological Association Annual Convention, Washington, D.C., at the Congress of Mental Health, London, England and at the International Congress of Psychologists in Tokyo, Japan.

LANGUAGE AND READING

Vivian M. Horner, Ph.D.

It is very gratifying to be introduced as being associated with the most exciting innovation in education in a great many years. I think that according to our recent calculations, Sesame Street is now reaching 10% more children then there are in existence. Sesame Street is indeed alive and well, and the Electric Company which has not quite as much, perhaps, intricate interest is also doing quite well. The Electric Company may well be the teacher of the largest reading class in existence. As of the first of December, we had two million, five hundred thousand children in our class, so something is going on out there.

I noticed that I am supposed to be talking about language and reading. I am going to try to narrow that down a little bit (coming in as an outsider) to talk about some of my speculations on television as an audio-visual medium and to try to explore with you the kinds of things that we would like to do. Since I am trained as a linguist, I spend a great deal of time thinking about language and related problems and when I discovered that one of the focuses of your discussions yesterday (and continuing into today) was auditory comprehension, that pleased me very much. This is a neglected area, even in the domain of linguistics and certainly a very, very crucial area in reading.

Let me begin by giving a little background on the Electric Company program itself, and on television as a medium; then we will move into some of the related questions on language and reading. For those of you who are not familiar with the Electric Company show, its general curriculum approach focuses on decoding. The English language has a lot of quirks, as we all know, and our writing system has a lot of quirks, but by and large, it's systematic. So if decoding is stressed and the regularity of the language is stressed, the quirks can be dealt with a little later; that is the kind of basic approach which we took. Out of the nine, ten, twelve or five hundred approaches to language learning you will probably find all of them represented in the program.

Vivian M. Horner, Ph.D.

We were working within the constraints of public braodcast television, so obviously one of the things we had to do was to make the assumption that on any given day, children would be watching who had never seen the program before, or who watched it very irregularly. This forced us to take a very eclectic approach, making an attempt to make each program self-contained and to have curriculum elements in it that would be appropriate for children at various levels of reading skill. It is non-comprehensive. We do not pretend to be teaching reading but what we are doing is using television to try to support the teaching of reading. We drew upon its entertainment value, hopefully to motivate some children who had difficulties in the classroom and the program is aimed particularly at seven to ten year olds who are experiencing difficulties in learning to read.

Research is a very, very integral part of what we do. When we are contemplating a show, a producer and a researcher are selected to work with a Board of Advisors who provide expertise from all of the content and related areas for the program. Together they devise a curriculum. The research person during that phase, which usually lasts about a year, leads the producer by the hand through the complicated maze of subject matter and pedagogy. During this time the producer is formulating his ideas about how to get this across using television. Because he is a commercial television producer he has a pretty sensitive finger on the pulse of the public in a way that we as educators rarely do.

Then we go into a pilot phase when we put five or six or ten programs together following the general format that we think we would like to use. The researcher takes those out and tests them rather extensively on target audiences which in our case are kids (seven to ten year olds) having trouble learning to read. We find out whether they work. We have two major sorts of concerns: 1) attention (can we get them to look at it at all, because obviously if we cannot we are not going to teach them anything) and 2) comprehensive validity (a way of measuring the quality of the message which deals with how "clean" the message is being presented). Ultimately we want to get impact which would indicate what kinds of learning occur. Following the pilot we have a preliminary evaluation and a meeting with the whole Board of Advisors to make final decisions regarding curriculum and basic production.

Then we go into production. We work with a few weeks-lag-up on broadcast; the show that goes into the "can" today will be telecast nationwide in about two weeks. Now, this has several disadvantages which would be apparent, I think, immediately; the major one is that our production crew is often going stark raving mad during the production season because of the pressure. On the other hand, it has a tremendous advantage because it enables us to have an evolving show and we carry out research throughout the entire process. My major job, once we are in production, is to let kids tell me how effective we are in what we are trying to do. So, my research crew is out in the field all the time working with children to see whether, in fact, programs are communicating well; what the kids are learning; whether they understand what they are seeing; whether they like what they are seeing, and so on. All of this information feeds into the production process, so that Sesame Street looks very different now from what it looked like three years ago. The Electric Company looks somewhat different this year from what it looked like last year and it will look a good deal different next year as we learn more and more from audience feedback. This is the basic way we operate. We have a lot of other research that goes on. As most of you know, e.g., Educational Testing Service has done several studies for us on the impact of our program.

Now I would like to talk a little bit about television as a medium and what I perceive as some of the advantages and disadvantages in terms of reading. Again, I have to say that most of what I have to say about reading is speculative. I am not a reading expert, but its problem has concerned me for a long time and as a linguist I have attempted to come at it from a different angle. It has always seemed to me, at least initially, if we only speak of the beginning process of learning to read, that it is not hard. It shouldn't be hard. It has seemed as if it should be easy and I keep trying to reach for a way to conceptualize it that could take us away from what I would see, perhaps as artifacts, of the way we teach.

If we speak quite honestly of teaching reading, we

Vivian M. Horner, Ph.D.

have to consider ourselves artists with a good deal of scientific backup and skill, but we do not have the answers. We do not know how children learn to read. We know how some children learn to read or at least we know that if we teach them in certain ways some of them learn, but all we seem to really know for sure is that if enough time is spent at it, trying enough different things with enough different kids, that those kids can learn to read. Somehow or other we keep working to try to pull that together in some more coherent way to find out what the magic element is and I do not know if we will find it. That is the quest and I spend a lot of time thinking about it, too. In any case, the initial reading process would appear to involve at least two things. One, as the linguist would put it, is learning to recognize the recurrent partials. The term, recurrent partials, is a good one, because I have not the foggiest notion what the "magic" partial might be. There can be partials of different sizes that seem to get combined into meaningful language. Phonics assumes that it is the phoneme or something closely related. The WHOLE-WORD APPROACH assumes that it is the "word" or something related. The LINGUISTIC APPROACH assumes that it is "affixes" and words and stems and a variety of other units (morphologic and syntactic) and possibly even semantic in terms of current theory. So, recognizing recurrent partials has got to be one part of the process. The second part of the process, it seems to me, is one of being able to synthesize these partials into something recognizable as speech. Very often we do not really question that. We are often not in contact with the fact that this is not really as easy as it looks. Somehow or other, getting the child to the point where he can recognize that the "noise making" he is doing in response to the "squiggles" on the paper is in fact, speech. If we want to utilize the intuitive knowledge of the child of his own language, we have to somehow get to the point. Obviously there is much, much more involved than that but those two things, seem to me, to be of particular concern for what I am doing because television as a medium for teaching reading (and due to its very nature) seems to almost be inherently contradictory. As

I have grown more experienced, however, I feel less that way. I think that it can be used to do certain things and I think that it can be used to do these two particular things very well. You cannot get much "text" on a television set nor should you want to because people do not "read" television sets. On the other hand, television is very effective as a simple kind of classical conditioning. (You put two things together and they are reinforced and they come to be associated with each other). The other thing that television does superbly well, which we are only just beginning to understand, is social modeling. We have discovered, unfortunately, through the studies investigating the effects of violence on television, that television is a very effective model. If you have people on the TV screen behaving in a particular way, given certain situations, children, in fact, learn from that. They learn a lot about "attitudes"; they learn a lot of "behaviors"; they learn a lot of "postures". This suggests that certain motivational aspects of reading might be well handled by modeling appropriately on television. The other thing that television can do because it is an audio-visual and dynamic medium, is make the eyeballs do certain things because the eyeballs will follow anything that moves, so that you can actually manipulate the visual medium at the same time that you manipulate the auditory. From the point of view of *beginning* reading, that is sometimes useful. I have to say in all honesty that we do not know that this is what we are doing, but I *think* that this is what we are doing. The evidence is beginning to accumulate now that in the areas where we are most effective, we are doing things of this kind.

I would like to show you a few segments from the show to give you some idea of how we attempt to "sound out" for the student a word he does not know - the recurrent partial. What happens during the "scanning" process? Remember, we have to take the student where we find him. He is a television watcher; he is very sophisticated in what has come to be called *visual literacy*. He is an *experienced* television watcher. He is familiar with the conventions of television and he knows exactly what to expect from cartoons when a certain kind of music comes on e.g., "this is a 'scary' sequence", or "this is a 'love' sequence." There are conventions of television with which he has become very familiar from watching endless of thousands of hours. We take these conventions and take this experience on the part of the child and try to turn it to our own purposes.

The following films were shown:

The Sign Song

The Message Man

Mandy Can't See The Sand

The Silent "E"

I got to talking this morning, when I first came in, about the whole business of auditory comprehension and I mentioned a piece of research which I would like to throw out to you because it rather fascinates me. There is a man named Bernard Friedlander, at the University of Hartford, who has a device which has a video screen and a dual audio track (something like a stereo). He has been working for a great many years with speech problems and problems of mental retardation. He begins on a very gross level to investigate the question of auditory attention with this auditory device. For example, he would show a cartoon; on one auditory channel he would have the 'neural' sound track that went with it and on the other auditory track he would have garbled speech (where it is clearly recognizable as human speech). There is a switch mechanism which switches from one track to the other every so often. He wanted to see how long it would take the kids to learn the task of hitting the switch to put it back where it should be. He gave this very gross test to approximately forty-four normal children and he discovered that one quarter of the children showed preference for the garbled track. Now this was not a single instance.

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This was over many times after many hours of tests over a long period of time and clearly there were about twenty-five of the children who showed a strong preference for the garbled track. He wondered what made them prefer the garbled track, so he went back, retrospectively, and took a look at the performance of those kids in the classrooms and discovered without exception that they were all having difficulties with reading. Now, this does not prove a thing, but it is extremely provocative. He has done a good deal of work since then and I heard him say recently that if we had any idea how bad the auditory comprehension of most children is, we would find it remarkable that any of them learn to read. If we consider the peculiarities of our language, the way it is written and the way we choose to teach it, we have a system which is posited upon the assumption that the auditory comprehension of minute detail is not only a possibility but a **highly** developed skill.

One of the things that has become defeating for us in our attempts to teach reading is the fact that we do not even have the support of the culture anymore in building the kind of detailed attention to speech that we once had. If you really want to get speculative about it, you can take a look at the rather non-verbal quality of many young people today. They do not enjoy conversation in the same way that most of us did. They may spend long hours talking with each other and saying very complex things like, "Yea, man, I dig," "Groovy," which all of us did in our own particular slang of the time. But there is much more **"Down-playing"** of world **communication**, so it may very well be that in your deliberations about the importance of oral communication you have laid your finger on one of the most crucial things that we have got to do in modifying our approach to education.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Horner, Dr. Vivian Language and Reading

1) What methodology can be developed to help students synthesize recurrent partials into recognizable speech?

2) Is scientific data available to support the advantages of exposing the student to the visual aspects of language and reading simultaneously with the auditory?

VISUAL LITERACY PROGRAM

MR. JACK DEBES

One of the founders of the annual national convention on Visual Literacy, Mr. Debes has worked with Kodak and is now directing the center for Visual Literacy at the University of Rochester.

VISUAL LITERACY

Debes, Jack

I was pleased to listen to Dr. Vivian Horner because what she had to say rests upon the very phenomenon about which I would like to speak. What the people at The Electric Company are doing is applying the full sophistication, as presently known, of visually literate people, to achieve mass communication effects and mass education goals. We hear a great deal about individualized instruction, these days, and there is no doubt at all that the individual child has individual needs. But, I think it is a good idea to bear in mind that the biggest change that has ever occurred in our society, in terms of transformation of the young and the information of the young, has come about with the least personal and, in fact, the most impersonal of all the educational devices we have ever had to use. There is nothing one can do to a television set except turn it off or turn it on. If one wants to watch it one can change programs but one cannot affect the image. The image is there and one has to deal with it as it is or forget it. I'm talking about a tremendous transformation that has occurred in our young people. Those of you who are closest to the children who enter school, if you haven't already announced it to your friends or talked about it with the other teachers, know very well that there is a sharp difference between the youngsters that you are seeing in your classrooms today and the children you saw eight or ten years ago. The longer your history in education, the more likely you are to be willing to talk about this matter.

I have a film made by a young boy who is a student in the fifth grade in a school in which all of the students have been identified as having special learning problems. Some are identified as Educable Mentally Retarded; others have a host of different problems. It is not, in other words, a "normal fifth grade." The boys used many different materials to make the film. What is most obvious is the fact that this particular boy made great use of photographs from the now defunct publications, LIFE AND LOOK. The film is full of fascinating things. For example, there were shots of the astronauts in their moon walk suits and the camera was jiggled in various ways to give the impression that the men were walking. I mention this because you are all aware of some of the very sophisticated films around. Yet, I want to assure you that all of you have in your classes of children or in your teacher training classrooms, a great deal of conceptualization ability. You have classrooms of youngsters who can express themselves, very well indeed, by the visual media. I'm talking about a level of what we're beginning to call VISUAL LITERACY.

What I have to say commences with a very young child. It commences, in fact, with the question of the eye of the child. Recent research shows that contrary to our former beliefs, children, at the youngest ages we can test them, have sharp vision, sharp perception, good depth perception. Research by such people as Dr. Ralph Norman Haber show that not only do babies see sharply but they remember what they see. Haber's research shows that we forget almost nothing that we see. The research that Haber carried out was convincing, that he concluded that if we don't remember something it is because we weren't really attending. It is there if we have attended. What he did was to show thousands of slides to college freshman and sophomores; mixed into these thousands were one or two repeats. All they had to do was to indicate if they had seen something before. Almost no mistakes were made, at any time in the experiment. These results were so fantastic because the slides were shown very rapidly.

The nature and importance of our visual memory is beginning to be the subject of a very considerable amount of research. What we are pretty sure of, now, is that the visual memory commences at once and begins to build up a resource of what is now called our visual vocabulary. We build up a vocabulary of signs, in the semantic sense, i.e. something that stands for something else. Visual vocabulary begins to form exceedingly early.

A recent conference in Australia sponsored by UNESCO was concerned with the subject of visual communication and its effects on the various cultures of the world.

Debes, Jack

I find it very interesting that five of the principal speakers at the conference used the term "visual vocabulary." This is an indication that they accepted the idea that what we read, visually, are signs for the reality and not the reality. This is a difficult thing to internalize if you haven't thought about it or haven't worked with it.

What we begin to see is not the reality, but an interpretation of the reality presented to us by our senses. How does this begin to work on the child; how does it affect the child's way of learning? He begins very early to see motion, not things or gestalts, but motion. There is a mechanism in the back of the brain called the colliculus which has a principal function of making us attend to things that change or move. That's a very fundamental but primitive kind of thing, because it is things that move that would prove to be the greatest threat to us originally. Thus, babies see things that move first, and they don't see mama's face, as much as she'd like to believe that. If mama moves her face, though, they see that and begin to make sense with it. What kinds of things make sense to them? Perhaps it begins with noting the bottle with it's nipple coming toward them. They work backwards from there. If the approaching bottle becomes a sign that they recognize then they may see the bottle being prepared and say, "Oh, I know what's coming." They keep noting the steps in backward steps. Pretty soon when mama goes to the refrigerator they are all tuned in already. They have learned to trust and to accept these related movements. This is because all the rest of the sequence is, in effect, a set of signs arranged in such a way that they can understand them.

Some of us are accustomed to thinking that children become intelligent and that we are able to begin to work with them when we can talk to them and when we can begin to understand what they say. What does that rest on? It doesn't rest on a continuous repetition of the words or sounds. Those sounds have nothing to go with them. They go into the brain and stay there unless there is some meaning connected to them. A CHILD IS MEANING

CENTERED; MEANING ORIENTED. You are meaning oriented. The child is very primitive. Initially, what has meaning for him is food and personal satisfaction. These events with meaning begin his store of visual memories. With this chain of acquisition of visual memory in mind, conjecturing about the impact of TV on children becomes a very serious game indeed.

Some researchers are trying to find out whether or not children are damaged by TV. There is a question of modeling, and so on. In my opinion if they are spending so much time on that, they are missing the most exciting part of all, because, it is perfectly clear that children exposed to TV during their early years come to school very different from those of prior times. In what way they are different is something that we don't know, but which we are beginning to study. The air has been filled with conjectures by Marshall McLuhan and many others. In essence, children are exposed to highly sophisticated information on TV. They are beginning to get more exposed to multi-messages - both different visual messages and verbal messages. There is sound with it and there are printed words with it; there are different visual components. There are a multitude of different messages presented simultaneously. The result is that when children are presented with multigraphics on printed pages, they can take in several pictures at a time, mouthe the meanings and come up with a unified meaning for the whole. Recently, I saw a good example of this. Two short films were presented simultaneously. One was about a kitten being born, being a tiny kitten, beginning to eat, etc. The other was about a little pig being born, learning to eat, etc. The films were run side by side and were very carefully cut. The question asked of the subjects was, "What was this about?" In a few cases, people said "It was about two different creatures being born and growing a little." A six year old child said, "It's about how exactly alike they are when they are growing up." He got the idea that there were two messages presented simultaneously so that one idea could be transmitted.

Debes, Jack

Research into how TV has actually changed the child has not been directed very closely to the question. But some people are doing research very close to this area. Dr. Griffith, an audiologist and speech pathologist, at the University of Eastern Illinois, has tested whether or not children do indeed react differently to visual sequences than adults who have not been exposed to television. If you have worked with children visually you have said, to yourself or others, "Gee, the children are so much faster than I am, visually." I have had people, who have worked with youngsters making films, say, "I couldn't begin to make things as good as my youngsters turn out." What is the basis for this difference? Technically, at the moment, I have to honestly say I don't know.

At the University of Eastern Illinois Griffith did an interesting experiment. He gave some still cameras to a group of youngsters under the age of fourteen. He also gave still cameras to a group of adults above the age of forty. His instructions were, "Go out and make pictures of something that concerns you." He didn't tell them to make a sequence; he just told them to arrange them. He got, in a few cases, structures of pictures, patterns of pictures in which the person had nothing sequential in mind, but for the most part, he got sequences. He then set up a semantic differential, a scale for them to score with. Categories included highly logical, highly illogical, beautiful-ugly, turns me on-turns me off. In other words, a lot of gradients they could score. He then presented the pictures and score sheets to separate audiences of children under 14 and adults over 40. I guess you can anticipate the results. The sequences that the youngsters favored, the adults disliked. There was very little overlap and in almost no case did any one produce a sequence that the members of the opposite age group preferred. Does this say that youngsters raised with TV differ in attitude toward sequencing than adults who hadn't been raised on TV? Let's just say that's one side. There is also the possibility that if you waited for the 14 year olds to become 40, you'd get the same results. What Griffith's research did was to raise the question of whether these differences in perceptual inclination between youngsters and adults have any important consequences in education and in communication. The question is being asked in many ways and it is being answered in many ways.

Some of the more interesting answers have been given in the results of a recent experiment by Dr. Gene Sines and co-workers in Washington, D. C. The study is called "Unexpected Reading Failure." These researchers rounded up 250 youngsters who had trouble reading at the third grade level. They went through the group to see if there was any possible reason for reading failure that they could pinpoint, e.g., if the mother and father were separated or if there was a previous child in the family who had a reading problem. All of these removed from the experimental population. They ended up with 52 boys and one girl. They were so surprised that the girl was there, that they looked further and discovered that there had been something in a previous school district, so she was eliminated. They had 52 boys left in the experimental population. They then subjected these boys to 76 different kinds of perceptual, conceptual, cognitive tests. What they discovered was that all of these boys had a similar attribute but in different degrees. The attribute they discovered was 3 D vision. THE HIGHER THEIR CAPACITY FOR 3 D VISION, THE LOWER THEIR CAPACITY FOR READING. The converse was also true, of course. What the authors concluded was that if, in the future, we want to identify our chess players, military strategists, architects, etc., we should look for third grade boys who are having reading problems. If it is true that at least one-third of us have these capacities, and if it is true that these capacities interfere with reading, isn't it fortunate that schools are in a position to provide youngsters with opportunities to express themselves in other than verbal ways? The art programs, the visual literacy programs that give our youngsters the opportunities to express themselves in non-linear or non-dimensional ways are giving young minds, that are widely conceptual, opportunities to express themselves. This is an opportunity they need so badly.

In my opinion and in the opinion of others working closely on visual literacy experiences, the visual literacy experiences may be mandatory before the verbalized experience can be internalized properly. Rauer at the University of California recommends that maybe we shouldn't start teaching reading until the 8th grade. One teacher in South America is teaching 14 year old children to read difficult material in a few months, e.g., he uses essays by Stuart Chase.

Studies like the one mentioned above raise the question: What is the nature of cognition? That is what I've been addressing myself to, cognition and conceptualization. I think we are faced with plenty of evidence, now, that the CONCEPTUAL CAPACITIES OF THE GENERATION WE'RE FACING IN THE CLASSROOM, EXCEEDS ANY OTHER GENERATION WE'VE HAD. Certainly Sesame Street and The Electric Company are part of it, but there is a great deal more.

A man called Randauer, at the University of Toronto, decided that one problem may be that we are talking to kids who are visual first. (That's what I've been asserting throughout this talk). To put it another way, in the case of a child who is visual, we are asking the child to make a translation from the visual background (vocabulary) to a verbal one. What we are really saying is, "You understand this visually, now tell me about it verbally". I am not saying that the verbal skills are not important. So much depends on verbal skills. What I am saying is that maybe a different base might be necessary. Randauer looked into this by posing some problems to a group of college people - again, not children. He created a group of visuals that they could use to answer questions about the problems he posed. He assumed that they had the verbal skills. He took the same information and encoded it into visual form and then into verbal form. To one group he presented the information in visual form and gave half of them the option of responding visually; the other half was to respond verbally. The second group got the information in verbal form and he gave them the choice of responding either visually or verbally. The results were that those who got the information visually and responded with visual symbols showed a much higher degree of internalization of correct responses than any of the other groups. Quite a bit further down on the scale were those who got the information verbally and responded visually. Next on the scale were those who got the information visually and answered verbally. At the bottom of the scale were those who got the information verbally and responded verbally. These were college kids. He selected them because they were verbal, and he still got those results. With the future before us, the opportunities for youngsters to be exposed to multi-dimensional, multi-message material will be on the increase. With the presence of video recorders in the home and the advent of any child being able to use dial access equipment to select his own visual programming or audiovisual programming, the youngsters are going to become more and more visual in their responses rather than less. They are going to become more sophisticated in their capacity to take in information visually. As we go along, the convention of visual expression will become more and more clearly established, so that, fleeting glances of something will tell you a whole idea. Why? Because it is an already established convention that something stands for something else.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Debes, Mr. Jack Visual Literacy Program

1) What methodology changes can be made, by speech and reading specialists, to make maximum use of 3-Dimensional visual skills of poor readers?

2) How can the speech and reading specialist make use of the research results being developed by visual literacy specialists? What practical applications are possible?

VISUAL LITERACY

A BRIEF REVIEW OF CONCEPT AND HISTORY

Our nation's children have been showing us that our schools do not suit their needs. Tens of thousands of the extreme have dropped out; millions of the more passive have stayed and merely "failed". But, it is we in education who have failed - not the children. The children we have failed worst have been the inner-city, the migrant, the bi-lingual, the black, the vocationally oriented, the non-verbal, and all that whole generation of children who have found, through television, that it is easier, faster and more pleasant to learn visually. They are very different than any generation we have had before.

Some educators, industrial and business people, professional communicators, guidance workers, and specialists in learning problems have been experimenting with a set of new and hopeful concepts and practices, now called "Visual Literacy". Through their work they have bridged the gap between the academic, the relevant, the "vocational" and the artistic, and so succeeded in "reaching" thousands of youngsters they had failed to reach before and at all grade levels.

The State Education Department of the University of the State of New York invited school administrators to participate in a statewide Visual Literacy Conference held April 4 to 6, 1971. A letter supported by Commissioner Ewald Nyquist said, "Educators are all aware that the present social and cultural revolutions are demanding a re-examination of educational offerings. In searching for new solutions to educational challenges, the Visual Literacy concept presents exciting potential. Forward-looking schools are establishing programs based on research findings related to this concept. The task ahead is to make the implementation of the classroom practices suggested by these theories quickly available to schools."

Practices leading to Visual Literacy, like practices leading to verbal literacy, tend to favorably affect all aspects of personal development. It enhances or develops such necessary aspects of the individual as self-concept, environmental awareness, and a sense of being able to exercise some control in a society in which the young are often beset with a feeling of powerlessness. It develops the capacity to order ideas, to express oneself eloquently without words, and collaterally, it expands the articulateness of the individual to use verbal speech and writing.

What are these puissant practices? They are misleadingly simple in appearance but then, "What is so great about a pencil and paper?" Character, role playing, and improvisational theater provide body language (kinesic) opportunities with many perceptual goals; seeing oneself on video develops self-concept; finding and arranging published pictures is an activity which, when followed by opportunities to talk and write, lets a child grow on material of his own selection; taking snapshots has almost a magical effect on motivation and parental involvement; movie-making leads to more careful linear thinking about self and society; and screen, slide-tape "composition" challenge high school students in English, art, social studies and comprehensive education with eager acceptance. This challenge and success in expression is pleasing to both student and teacher.

Perhaps more than any approach to education yet conceived, Visual Literacy practices generate upside down curricula that are authentically individual and grow naturally from what the teacher assays to do.

This material was distributed by:
Jack Debes, Center For Visual Literacy,
University of Rochester
Rochester, New York

PANEL

DR. BLUMA WEINER

Prior to her appointment as a Professor at Yeshiva University, Dr. Bluma Weiner had practical experience in the field as a class teacher and as a Special Education teacher. She has lectured extensively and she is presently Chairman of the Special Education Department.

APPROACHES TO READING INSTRUCTION

Dr. Bluma Weiner

I would like to begin with some premises that are very dear to my heart. First, I professionally acknowledge the psycholinguistic foundation of learning to read and reading to learn. This includes the auditory reception, the visual reception, the auditory association, the visual association, the verbal expression, motoric expression, (particularly manual), auditory memory, grammatic enclosure, auditory enclosure and sound blending. These are drawn particularly from the psycholinguistic model presented by Kirk and McCarthy in their Illinois Test of Psycholinguistic Ability (ITPA).

My second statement is a very personal one: no child should be defined out of rightful services. As Special Educators, we do find many children to whom we give a label and then we frequently say, "Because we put this label on them nothing can be done."

The third point is essentially a charge and it may become a mandate, particularly with the "right to read" effort becoming more prominent. My charge or mandate is, that every teacher could be and I think should be a teacher of language and hence potentially a teacher of reading. This is my definition of what I call the reading circuit. One could break in at any point, but I am going to start with the feeling or the idea or the thought that an individual has the amorphous squirmings inside that may be at visceral or at cognitive levels, wherever it is, it ultimately seeks expression and is expressed in one of two channels or one of two ways. The one I won't explore here which is a physiological level or "gut" level dealing with reflexes and the autonomic nervous system. The other, the symbolic level, is what I am concerned with here - the symbolic expression of the feeling, the idea, or the thought. Again we have two pathways: 1) the level of gesture that is observed kinesthetically, the individual person (performer) expresses it in kinesthetic movement and the observer notes it visually; 2) the vocalization or verbal utterance. The latter level also has several components but the major component is the sound component. The receiver as well as the expresser experience it auditorially.

How are these expressions moved along the circuit?

Next we "save" them in some way. If we want to move along the reading circuit, gestures can be saved in various ways, such as by taking pictures or recording them on film. With a recording on film we can have a replay. With a printed symbol, i.e., a written sign, we retrieve or get the written expression back through the process of associative recall. There is, technically, a perceiving of the sign and an association to it. This is not simply a symbol association or the relating of the sign (or squiggle) to a sound (syllable), but a meaningful association; one that conveys some content. That brings us back to the meaningful association, the feeling, the idea or the thought with which we began. The circuit is the same for all and reading is the special component of this circuit.

What are some of the support pillars? What are some of the things that our students need and probably what most students need? (We must be especially sensitive about needs when we know our youngsters come to us after having had negative experiences, very limited experiences or simply very incomplete experiences). I think of meaning in the following way: There are things to know about in the world around us, places to go, worlds to see, and things to do; a context, something to talk about, and hence eventually to be able to read about, to know about. Again there are levels of experience. There is the level of experience that I call the labeling or the vocabulary element. It is on this level that many of our children are shortchanged because they do not know enough words to name or describe what has happened to them or what they like. The youngsters with thom I have worked are essentially penalized in that way. Far too frequently, they simply are not given enough opportunities to talk. Finally there is the level of experience of practicing or rehearsal. At this level the youngster gets a chance to try out different ways of talking and to experiment with different ways of presenting himself so that he is comfortable with spoken words.

I call this experience level or practice level, "fun with the fundamentals." Some I call "names" and some I call "games." "Names"involves naming the object and playing with the object; naming of people, naming of actions and naming of feelings. This is getting into the area of confluent education. How do you feel? How do you talk about your feelings? You feel glad, you feel sad, mad or bad. We do not allow much talk about feelings and yet we should. It is terribly dishonest when we do not. It seems that we expect the youngster to get all aglow about "hen tracks" (written words) but we do not allow any other affective experience and response.

"Games" provide similar experiences. There are things one can do with rhymes, with riddles, and there are things one can do with roles. There are the "I am" or "I can do" kinds of games. There are the "I've got a secret" games on a more sophisticated level for older children. Finally there are the games I call relating games. In these games the children, especially older children (but younger ones too) have a chance to report not only descriptively, but to state what they see or what happened. They literally "rap" in the current sense of the word. They get a chance to state, to complain, to unload with feeling. These are just some of the ways of approaching the "funless" fundamentals and these will give the youngsters a chance to deal with material that is sufficiently meaningful, to write it and to read about it.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Weiner, Dr. Bluma Panel

1) What skills and talents can the Speech Therapist help the classroom teacher develop, for herself and her class, to facilitate the concentration on oral activities that Dr. Weiner suggests are necessary for good reading development?

PANEL

DR. PHYLLIS KORNFELD

In her capacity as a reading specialist in Westchester, Dr. Phyllis Kornfeld had the opportunity to guide many boys and girls in developing reading skills. Currently she is training teachers of reading at Yeshiva University.

ASPECTS OF READING INSTRUCTION: LEVELS OF BEHAVIOR

Dr. Phyllis Kornfeld

I am going to talk to you about reading as communication, as a process that goes far beyond the act of decoding the written symbols on the page. First however, I would like to briefly discuss three points in regard to oral communication.

The first point is that the oral tradition is the foundation of reading, just as it is the beginning of communication. Second it is of the greatest importance to keep in mind at all times that a child's language is his personal possession. It is a reflection of his personality, his family, of the block he lives on, and of his neighborhood. His language, then is a reflection of his background. The inference of that statement is that we must accept the language that the child brings to us, and not try to change it too soon. The third point involves the question: "What is too soon?" I think that "too soon" is before the child realizes that we accept the language he brings with him, as we accept him as a worthy human being. Until he is aware of our unconditional acceptance of him, it is treading on dangerous territory to try to change his language.

Over and beyond those three points, there are some aspects of instructional systems that I would like to review with you. You are probably familiar with the Initial Teaching Alphabet (ITA) which associates a symbol with every sound. Basal readers, which we have all known for a long time, are undergoing a change. The vocabulary is not controlled as strictly as it once was. There are new words called decodable words, for example children are expected to sound out on the basis of the phonetic skills they have been taught. Both of these approaches emphasize, heavily, the word recognition aspect of reading, although the basal reader approach considers the development of reading comprehension abilities to a greater degree than the ITA does. The "Words in Color" approach, too, emphasizes the decoding aspect of reading.

Individualized reading regards word recognition as a necessary means to the end of reading for meaning. The major point that I would like us to consider today is: What do we think of, when we hear the phrase: "Reading for meaning?" You probably think of reading for the main idea, reading for supporting details, predicting outcomes, and drawing conclusions. This is all very good; however, it is of the greatest importance that we consider all of the instructional systems, or approaches to reading in terms of the comprehension abilities that they purport to develop. There are deeper meanings than the ones previously mentioned, that can be discovered by the good reader.

While reading fiction, for example, the child should be taught to analyze the character's actions, reactions and motivations. You may ask: "Why is this necessary?" The answer is that the heart of the story lies within the character. A story is not a simple recounting of a series of events. A story unfolds through the copings of a character with the circumstances of his life situation. The plot unfolds through these copings, as the character grows and develops. There are other ideas to be looked into also, beyond main idea, details and character development.

The reader should be helped to understand the setting of the story. If you think of Alice in Wonderland, and of Alice going through the looking glass to the parlor on the other side, you will realize that the parlor is a setting that came to life in the story. In our world, we cannot pass through a looking glass, nor go down a rabbit hole, as Alice did. We should help our children to understand the setting as one of the integral elements of the story because the setting influences the ways in which the fictional characters live out their fictional existence.

There are other components of reading comprehension, such as chronological and psycological time. As we know it, a week is comprised of seven days, these calendar days are chronological time, not psychological time. What, then, do we mean by psychological time? Think, if you will, of a child who is waiting a week for his birthday, when he is going to receive a gift he has been longing for and you will have a conception of the eternity of waiting that week can be. This is what is meant by psychological time. A gifted author manages to convey a feeling of the brevity or lengthiness of the passage of a period of time, in accordance with the character's perceptions of whether time is passing quickly or slowly.

The child should be taught, too, to evaluate the material he reads. The first thing that comes to mind in regard to evaluation is, probably, to look at informational material to come to a decision as to its accuracy and verificibility. In regard to fictional literature, we should have a standard of judgment too, namely; Is this story believable? Has the author made it possible for us to enter into the world he created? For the time that we are reading, is it possible for us to believe that somewhere, at some time, such a place existed? If the story is a fairy tale or a tall tale, has the author made it possible for the reader to suspend his judgment and enter into the story world to believe, for awhile, that magical wonderful things can happen in this make-believe world? Fictional material, then as well as informational material needs to be evaluated by the reader.

A writer on the reading process, David Russell, said that if the time is right and the material is right, we can help a child read critically. We can help him go far beyond a literal interpretation of what is written on the page and perhaps, win some new insight into his own life situation as a result of what he has read.

In looking at all the instructional systems available today, we should look beyond the decoding, or word recognition aspect of reading. We should look at the instructional systems from the vantage point of teaching reading as the process of engagement between the reader and the author's message. We should evaluate the reading materials to see how far beyond reading for main ideas and details that the reader is encouraged to think and to comprehend. I would like to add that in the time allotted to me it has been possible to give only a skeletal structure of the reading comprehension process.

In closing, I would like to note that we, as New York City teachers are, of necessity, involved with our concern for the problem readers. Perhaps this is why we sometimes tend to look for the best approach, the best materials, to teach these children to read. I think that sometimes we overlook what may be the crucial factor in education: You think that education lies within the quality of the interactions between you and your students. Education lies within what you, as the teacher, do with the materials, and not within the materials or systems themselves.

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STUDIES OF HIGH INTENSITY LEARNING SYSTEMS - READING

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HIGH INTENSITY LEARNING SYSTEMS- READING is an instructional system which helps the teacher define each student's unique reading needs and prescribe appropriate activities to fill those needs. It is a system that permits one teacher to manage the individualized learning activities of 30 or more students per class hour. Used for over nine years, it has been modified daily by reading coordinators and teachers. It is an "open system," in a process of continual development.

An important impetus to the development of this **system has** been the movement toward accountability. Accountability in the school program means that the program defines precisely what a student will learn, and that any observer can see whether the student has learned it. The program clearly specifies appropriate objectives for each student's learning. Both the teacher and the student know exactly what the student must learn; they know the methods and materials he must use; and they know what he must do to show that he has learned, that he has mastered the specified objective.

The natural place to use HIGH INTENSITY LEARNING SYSTEMS-READING is a Reading Center, a room where students read books chosen from a wide variety of titles, and work on prescribed reading activities designed to strengthen specific skills. The Center contains a collection of the best reading materials currently available. These materials have been chosen for their wide variety of content, levels and skill requirements. Among them, almost any student can find activities suited to him. Most of the materials are self-directing and self-correcting, and are carefully sequenced so that the student can advance independently with a minimum of direction by the teacher.

The Reading Centers are designed to be attractive and inviting. Kits, workbooks and other prescribed reading materials are available in abundance. However, the most important materials available to the student are books, hundreds and hundreds of books. These books are selected to appeal to a wide range of interests and reading levels. Each student, no matter what else he may need to do, has the opportunity to read books of his own choosing.

When a student first comes to the Reading Center, he takes an individual module of Instructional Objective Tests (I-O Tests) designed to help the teacher determine his reading needs. These tests are keyed to an "I-O Catalogue," a catalogue of reading behaviors corresponding to these tests. For every reading behavior, the catalogue lists the exact materials in each publisher's reading kits and workbooks which the student can use to improve his ability to perform each I-O. Using the I-O Catalogue as a reference source, the teacher prescribes the appropriate reading activities for the student. As the student masters the prescribed instructional objectives, he takes new I-O Tests and receives new prescriptions. This process of diagnosis and prescription continues throughout the year.

The student is motivated to continue his involvement in the Reading Center by receiving direct feedback for everything he does (in psychological terms, for every time he responds to a learning stimulus). He gets feedback from the self-corrected learning activities, charts, graphs, Achievement Awards and opportunities to spend more time on reading activities; this feedback gives him reinforcement or "pay-off."

An overview of the System focuses on two basic sets of components. The first component is a Classroom Management System. A Classroom Management System does not replace the teacher, nor does it decide what each student should learn. It does, however, help the teacher make diagnostic decisions about a student's reading, by providing the behavioral analyses the teacher needs for assessments. It provides prescriptions for instruction based on these assessments. It also provides classroom management strategies and resources so that one teacher can operate as many individual curricula as there are students in the class.

The second component is a collection of reading materials from more than forty different publishers. These resources include trade books, kits, audio-visual materials and workbooks. They do not include any textbooks or basal readers. An inventory of these materials, in the exact quantities required, is automatically supplied with the Classroom Management System.

There are certain concepts fundamental to HIGH INTENSITY LEARNING SYSTEMS-READING. Most important are:

1. Prescriptive or "so what?" diagnosis. This system provides tools for analyzing each

student's reading behavior. More important, it answers the question "so what shall I do about it?" by helping the teacher prescribe appropriate activities for instruction.

2. Motivation. The system provides motivation through immediate reinforcement; the student gets "feedback" right away to let him know whether his response to a "learning stimulus" has been adequate. Feedback to the learner and presentation of appropriate learning stimuli are continuous processes.

3. Individualization. The system involves a large variety of specially designed materials, so the teacher can personalize content, rate and level for each student.

4. Intensified instruction. Students learn efficiently through an intensified approach using appropriate books, materials, technology and systems. High Intensity Learning maximizes the amount of "reading period" time each student spends on appropriate learning activities.

5. Performance objectives and criterion-referenced assessment techniques. With a goal of certain well-defined reading behaviors, schools can plan their curricula more clearly; they can also evaluate the student's performance knowing precisely what they are trying to measure.

Further examination of these concepts demonstrates the application of theory to classroom practice.

1. What is Prescriptive Diagnosis and what does it do? Prescriptive or "so what?" diagnosis helps a teacher find a way to teach the student to read. Prescriptive diagnosis does not assign a number ("third-grade level" or "4.7"), nor does it assign an etiological label ("developmental dyslexia" or "perceptual dysfunction"). It does answer the question "so what?" of the diagnostic information obtained. Prescriptive diagnosis has five main characteristics:

   a. It defines the specific reading behavior to be measured, usually by the nature of the test used.

b. It describes the behaviors operationally, usually by the nature of the test item. ("Select one of four alternative titles that expresses the paragraph's main idea." "Circle the initial consonant in the word.")

c. It defines the conditions of behavior, specifying such circumstances as "with a timed test" and "in a classroom."

d. It defines the criteria of mastery in such terms as "grade level achievement" or "percent correct." The teacher determines these criteria of mastery, taking into consideration the entering level of the student, his general level of ability, his degree of retardation, and the level of the materials available. The teacher then sets an expectancy level higher than the one the student is currently operating on, but low enough for him to reach in a relatively short time.

e. It answers the question "so what do I do about these findings?" The teacher does more than record a qualitative or quantitative designation to a sample of the student's test behavior. For example, the teacher does not simply say "Tom only got 40% correct on a test of initial consonants;" he also records a prescription, indicating exactly what activities Tom should work on to improve those particular skills.

2. Motivation is not simply getting the student's attention. Yelling or telling funny stories may be helpful devices to gain a student's attention, but they do not encourage him to attend to the learning task. What keeps the student motivated (attending to the learning task) is the kind of "pay-off" or reinforcement which he experiences right after he responds to a learning stimulus. This feedback, which comes from the same source as the learning stimulus, immediately lets him know if he has responded adequately to the stimulus. With this reinforcement the student has a tendency to pay attention to the source of the learning stimulus and the feedback. The instant in which he is attending to the stimulus-feedback source is the perfect time to present the next

learning stimulus. While he is attending, we have him motivated or "hooked," and that is the instant to "strike" again. This is intrinsic motivation-that is, the motivation is an integral part of the learning activity. Instructional materials in a High Intensity Reading Center are designed so that they continuously present appropriate learning stimuli and feedback-that is, they are motivating.

3.4 We know that individualization boosts intensity of instruction. In the mid-1960's, the U.S. Education Office's Cooperative Reading Research programs began to outline some significant findings about achievement patterns in classrooms. Several of these studies brought out the following important fact:

> If we compare any of the various published beginning reading programs, matching the classrooms both within each program and across each program, the difference from one program to another is LESS than the difference between certain classes using the same program.

Although they are using the same published program, some classrooms seem to do better than others. What matters is what the teacher and his students do with the program.

Certain studies have tried to pinpoint the characteristics of both the successful teacher and the successful class. These studies show that:

a. The more successful teachers (as defined by their student's higher reading-achievement levels) tend to differentiate (that is, individualize) their reading instruction more than the less successful teachers do.

b. Classes with higher reading achievement tend to spend more time on actual reading instruction than classes with lower reading achievement do.

Studies by S. Alan Cohen have shown that the more successful classes have a higher "participation-in-learning ratio" (P ratio) than the less successful classes.

The Cohen studies also show that given a period of time in which students are programmed to read, the more successful classes are those in which 85%-90% of the clock time is spent on prescribed learning-to-read activities. These activities are intensified by being adjusted individually to each student's interests and needs, and by allowing each student to work at his own level and his own rate.

A New way to conceptualize the student's strengths and weaknesses is demonstrated in High Intensity Learning Systems. Reading is "more than the test measures," but in order to read at a given level, the student must master certain skills. It is helpful to break these skills down into specific, concrete behaviors, each known as a "performance objective" or "instructional objective." Each behavior is defined operationally. For example:

> "Given a word visually, the student writes each syllable of the word separately."
>
> "After reading a selection, the student selects from four choices the statement that is not supported by the selection."

Specific assessment techniques can then be made for each of these behaviors.

A new role for the teacher emerges through the systems approach.

The learning principles embodied in HIGH INTENSITY LEARNING SYSTEMS-READING require a teacher who is different from the traditional "lecturer," "dispenser of knowledge," or "performer." The High Intensity teacher must be an instructional manager. He determines the target performance to be achieved; he diagnoses and prescribes. Guided by the system's assessments, he programs each learner by matching methods and materials to that learner's unique level and content needs. Classroom instruction becomes largely self-instruction or small student-team learning. Using the Catalogue of Instructional Objectives as a guide, the instructional manager adjusts the resources. The learner controls his own rate of learning, plus almost all the record-keeping.

The learner needs an instructional manager (teacher), but the learner is also a human being who needs the warmth and support of another human being. High Intensity classrooms free the teacher to give that support whenever it is needed, because the "lesson" does not depend upon continuous presentation or performance by a teacher. The teacher is able to confer and work with individuals or small groups of students, and to continue the ongoing process of diagnosis and prescription for each learner.

With the teaching role redefined to stress managing an environment to promote individual learning, the teacher is less and less a "control agent," and more and more a true teacher dealing with each student as a unique individual.

RESULTS OF HIGH INTENSITY LEARNING SYSTEMS

Table 1 below reports results in classrooms serving severely disadvantaged fourth and seventh graders in coal mining districts of Appalachia. Post testing was done by a source independent of the school systems or the curriculum designer; the tests used were the Iowa Basic Skills Tests for the seventh graders and SRA Achievement for the fourth graders. The methodology used was an early version of the High Intensity Learning System, the earliest form based on 225 behaviorally defined instructional objectives.

Table 1

RESULTS OF HIGH INTENSITY INSTRUCTION

IN LOW SES FOURTH AND SEVENTH GRADERS

School	N	grade	Pre test Mean	Aver. No of Instruct. Hours	Post test Mean
Ha	29	7	4.2	106	6.0
Ap	25	7	5.1	100	6.1
Cl	13	7	5.0	98	6.4
Er	10	7	4.6	under 100	5.1
Er	14	4	2.3	under 100	
Wi	25	4	2.7	102	3.9
Ap	27	4	2.8	104	3.7
Cl	21	4	2.8	100	3.9

These eight classes served the most underachieving children in a severly deprived area where reading achievement gains for such a population ordinarily average about .47 per full ten months of instruction. Special education categories and low IQ were not controlled, so that this population included a disproportionately high number of IQ's under 80. Over all, in about 100 hours of instruction (an hour per day or less) the average gain was 1.2 years growth. A second independent evaluation agency re-post tested another 250 children from these same schools three months later after summer vacation and with no intervening summer instruction. This report showed a 1.47 gain even with the two month summer lay off.

Table 2

RESULTS OF HIGH INTENSITY LEARNING SYSTEMS--READING IN A

NEWLY DESEGREGATED SOUTHERN SCHOOL

			Amount of Gain in 6 months	
Grade	N	IQ Means	VOCABULARY	COMPREHENSION
4	107	106	8 months	15 months
4	47	92*	8 "	12 "
5	97	111	8 1/2 "	8 1/2 "
6	135	107	9 1/2 "	26 "
6	44	93*	12 "	24 "

*Predicted gain for below average IQ is less than one month for one month's gain.

Table 2 presents data on fourth, fifth and sixth graders subjected to the first edition of the High Intensity Learning System based on 500 behaviorally defined instructional objectives, but executed with only 50% of the various instructional materials from 52 different publishers whose programs are coded into this system. The program was implemented in this middle class, suburban, Florida school at a time when it was beginning its first year of desegregation in the face of a national administration that had just announced its own decision not to force integration in the South. The low IQ groups in the fourth and fifth grade represent those Title I children bussed into the school. Post testing was done after six months of the systems approach to reading.

In less than six months under extreme community duress over the national administration's anti-busing stance, the school desegregated, nevertheless, and the amounts of gain at all levels were still 2 to 24 months above the expected gain. Two findings are of special interest. One is the comparison of gain scores for Title I children with those of non Title I children.

In general, they both made equal amounts of gains in the systems approach to instruction. A second finding shows markedly high jumps in vocabulary in the sixth grade classes. Large jumps in vocabulary on standardized tests are rare over short periods of time. But this finding corroborates three other data sources in different parts of the country using a systems approach to reading instruction. In all four instances, the teachers made heaviest use of those instructional activities that stressed the Random House Reading Program, Scholastic book packages, Prentice Hall's One to One--all programs based on heavy reading of hard and soft covered trade books as the basic part of the reading program.

Table 3

AVERAGE GAIN (IN MONTHS) FOR EACH GRADE LEVEL AFTER 3 MONTHS INSTRUCTION

CAT	Primary A N = 42	Primary B N = 50	Primary C N = 49	Intermed. A N = 53	Interm. B N = 55
VOCAB	.79	.36	.33	.50	.15
COMP	.75	.72	.49	.64	.56
TOTAL	.76	.45	.47	.63	.34

An unusual study of 249 upper middle class, suburban white children, grades one to five in an open space, ungraded elementary school in which the entire school was subjected to High Intensity Learning, generated dramatic gains compared to a comparable group that attended the same school the year before the systems approach was implemented. The pretesting was done six weeks after the High Intensity Learning System was implemented in an attempt to eliminate the usual initial growth spurt that occurs when a new program is first implemented. That spurt is often called the Hawthorne Effect. The idea was to try to cancel out as much of the initial growth spurt as possible to project, based on a short period of time, the effect of the systems approach over a long period of time. To make the gains even more conservative, these high achieving children's test scores were severely curtailed by the ceiling effect of the standardized tests, since most of the students ordinarily scored around + 1 standard deviation. The 249 subjects represented a one-third random sample of the total school.

Table 3 shows the average gains on the California Achievement Test for each grade level after three months of instruction. Again, considering that the initial six week gains--the largest gains in any new program-- are not reflected in these gain scores, the increases in achievement are dramatic. What would the actual gains be if pre testing had been done six weeks before, when the systems approach was first implemented? Using the previous year's students as a comparison group in a school with a stable staff, the amount of gains were most dramatic. As usual it is difficult to define what the "ordinary" reading program was like the previous year, except to describe it as what most reading specialists would consider a good program using regular basal readers in some cases, ITA and "individualized" instruction in other cases. Table 4 shows those results after seven weeks of the systems approach that we call High Intensity Instruction.

Table 4

A COMPARISON OF STUDENTS IN HIGH INTENSITY LEARNING CENTERS FOR 7 WEEKS AND COMPARABLE STUDENTS NOT IN THE CENTERS AT GRADE PLACEMENT 3.8 AND 5.8

	Primary C (3rd Graders)		Intermed B (5th Graders)	
	Vocab	Comp	Vocab	Comp
HIGH INTENSITY STUDENTS	4.8	4.7	7.3	8.0
NON HIGH INTENSITY STUDENTS FROM SAME SCHOOL	4.1	4.0	6.0	7.0
DIFFERENCE IN MONTHS	7	7	15	12

When we compare the students in 1972 after about seven weeks of High Intensity Learning with the same kinds of students, in the same school, taught by the same staff in 1971, we see hugh differences in favor of the newer curriculum.

Perhaps the most reliable evaluation of the systems approach comes out of the Omaha Public Schools where they started in 1971 with 19 installations, each serving 150 students from grades three to 12 and by the beginning of the 1972 year had increased the number of High Intensity Learning Systems to 30. In that school system, the systems approach has become the model for curriculum redesign in other areas of the curriculum.

The Omaha project is particularly important in the ongoing assessment of the curriculum design known as High Intensity Learning Systems--Reading because of its scope. Omaha provided a large population representing three major disadvantaged minorities (Black, Mexican American and White) covering most grade levels in 30 urban schools.

The average grade level growth for all grades in 4 1/2 months of instruction was 8.7 months, almost double the expected growth if the students had middle class--over 3 1/2 times the increase in growth over what is usually achieved by Title I inner city children.

Sixth graders showed the highest average growth of 11 + months in 4 1/4 months.

Sixth graders showed about 10 + months average growth in 4 1/2 months.

Third graders showed almost 10 months average growth in 4 1/2 months.

Fourth, fifth and eight graders showed over 8 months growth in 4 1/2 months.

Table 5 shows the data combined over 30 Centers, 2102 students, displayed by grade levels. The average gain for all students, in all Centers, at all grade levels was .87 of a year after .45 of a year's instruction, one class hour per day in the High Intensity Learning Systems--Reading. That represents almost double the expected gain for average students and over three times the expected gain for the Title I students in this school system.

In Grade 3, the average gain for 46 third graders across three Centers was about a full year (.99) in .45 of a year's instruction. That is more than double the expected gain for average students and almost a 400% increase over the expected gain for disadvantaged students who were selected for this project.

The average gain for 429 fourth graders across 16 Centers was .84 of a year after .45 year's instruction. That represents slightly less than double the expected gain in average fourth graders. For Title I children in this project this represents an increase over expected gain in excess of 330%.

The 493 fifth graders serviced by 17 different Centers and the 163 eight graders in 10 Centers showed approximately the same gains as the fourth graders.

The largest gains were made by 433 sixth graders in 17 Centers. After .45 year's instruction, the standardized tests showed 1.12 years growth. A close second was the 1.03 years growth in the 308 seventh graders. That, of course, represents over twice the gain expected of average students and over 400% greater gain than would ordinarily be made by the Title I students in this project.

TABLE 5: Average Pre, Post and Growth Scores

By: Grade Level after 4 1/2 months of HILS
(1 class hour per day)

Total N (30 Centers)	Total Aver. Gain in Years .87

		AVERAGE SCORES IN YEARS		
Grade	N	Pre	Post	Growth
3	46	2.25	3.24	.99*
4	429	2.68	3.52	.84*
5	493	3.18	4.00	.82*
6	433	4.09	5.20	1.12*
7	308	4.66	5.69	1.03*
8	163	5.35	6.20	.85*
9	113	6.90	7.16	.25
10	52	7.24	7.62	.38
11	61	7.57	8.12	.55

(*$P > .01$)

The test results in Grades 9-11 show gains at or above expectancy for this Title I population, but the testing was most unreliable due to the poor ability of the particular level of the Gates McGinitie Reading Test used to discriminate at that grade level. Since data for Grade 12 were based on only four students, the results were not charted in Table I. (Those results showed .98 gain in .45 years--over double the expectancy for average students and four times the expected gain for these Title I students.)

Table 6 presents the data by Center and by each grade in each Center. It is based on 1922 of the 2102 in the total project population, covering Grades 3-9 in 24 of the 30 Centers. Six Centers (180 students) were excluded from this table because of incomplete data, low N's and unrealiable test data. The Grade 9 results in five Centers (50 students) is relatively unreliable. Small N's of six (Center N) and one (Center J) cannot be taken as a reliable index of the treatment effect. The average loss of -1.25 years for 20 ninth graders in Center M is an indication of the unreliability of the test level used to assess the treatment effects in the high school. The -.35 loss in the two eighth graders in Center W is probably accurate. Two students could have scored less on the post test compared to their pre tests. Minus scores, of course, represent no practical gain, not "real" losses.

Beyond these cells, only 32 eight graders in Center X showed an average gain less than expectancy. In every other cell of Table 2, even in the "weakest" Centers, the average gains not only exceeded what would have been expected of these students (.25 years gain in .45 years instruction), but exceeded what would have been expected of average, on-grade level achievers (4 1/2 months gain in 4 1/2 months instruction).

By using Table 5 and 6 together, the reader can compare average gain at a grade level within any Center with the average gain of that grade level across all the Centers. For example, in Center I, the 30 seventh graders had an average gain of .98, almost a full year's gain in 4 1/2 months. Table 5 shows 1.03 as the average gain for all seventh grades in all the Centers, indicating that this Center did almost as well with its seventh graders as the average for all eleven Centers servicing seventh graders.

The total average gain for all grades in all 24 Centers in Table 2 is .92 in .45 years of instruction. The .92 figure allows the reader to compare each Center's average gain for all grade levels serviced by that Center with average gain for all 1922 students. For example, the average gain for 61 seventh graders and 39 eighth graders in Center A was 1.73. This is significantly greater than the .92 average gain for the total population. This indicates that Center A was markedly more effective than most other Centers.

TABLE 6 : AVERAGE GAINS IN 4 1/2 MONTHS OF HILS (1 HOUR PER DAY)

All Gains Expressed in Years

r. No.	Total N Per Ctr.	Aver. Gain Per Ctr.	Average Gain in Years for Grade... 3	4	5	6	7	8	9
A	100	1.73					1.79 61	1.64 39	
B	61	1.71	1.51 10	1.58 13	2.61 11	1.48 27			
C	58	1.30	1.21 19	1.02 14	1.53 25				
D	40	1.24					1.39 25	.73 3	1.04 12
E	71	1.18	.66 5	1.25 22	1.24 25	1.17 19			
F	116	1.08		.97 35	1.03 45	1.26 36			
G	42	1.05					1.29 15	.92 27	
H	99	1.01	.74 27	.98 34	1.23 38				
I	54	1.01					.98 30	.99 13	1.13 1
J	109	.99		1.02 34	.76 43	1.29 32			
K	62	.98			.95 15	1.09 17	.81 25	1.52 5	
L	93	.98		.99 51	.79 12	1.02 30			

Ctr. No.	Total N Per Ctr.	Aver. Gain Per Ctr.	Average Gain in Years for Grade... 3	4	5	6	7	8	9
M	121	.95		.83 54	.83 34	1.26 33			
N	86	.90	1.08 21	.49 13	1.20 19	1.20 13	.35 8	.92 6	.35 6
O	95	.84		.59 27	.66 36	1.24 32			
P	37	.76	.98 20	.90 3	.43 3	.42 11			
Q	99	.76		.68 24	.67 43	.93 32			
R	118	.76		1.06 23	.75 31	.66 19	.82 26	.42 19	
S	65	.74		.68 16	.75 26	.78 23			
T	116	.67		.48 36	.58 44	.97 36			
U	45	.58					.53 27	.68 17	.10 1
V	117	.50		.49 35	.48 56	.57 26			
W	48	.33					.36 46	-.35 2	
X	70	.14					.52 18	.09 32	-1.25 20

Total
N (24 Centers)
1922

Total
Aver.
Gain
.92

Total Average Gain Per
Grade Level Grades 3-9

Grade	3	4	5	6	7	8	9
Gain	.91	.87	.86	1.13	.94	.76	.27
N	46	429	493	433	308	163	50

Number of Trade Books Read

At the middle school level in Omaha, Nebraska, with Title I children from December 8, 1971 to April 25, 1972, slightly less than 100 children read 3080 books for the national reading record in High Intensity Learning Systems. This is a selected instance representative of the tendency toward a marked surge in the reading of tradebooks as a result of the systems approach. It is, of course, unique in its intensity. Based on data from five school districts in Virginia, three in New York, one in Nebraska and one in Florida, the median increase in amount of tradebooks read for children and adolescents in a systems approach to curriculum design in reading is about five times their normal reading. This is true across socioeconomic levels and geographic area (rural, urban, suburban).

Number of Instructional Objectives Mastered

On the average, students at any grade level seem to master about 28 new instructional objectives per seven month period. Our impressions are that the number of new instructional objectives that could be mastered per student per year could increased markedly with more pressure on teachers, but with no appreciably increase of pressure on students. We are currently investigating teacher accountability strategies to test this impression.

P Ratio Increases

In a number of studies, some of which are published elsewhere, High Intensity Learning Systems produce P Ratios from 70 to 80% compared to average classroom student participation in learning ratios of 40%. In other words, the systems approach generates about 100% more student motivation (attentiveness to reading tasks) than average classrooms.

Joan Hyman, Ph.D.

THE ROLE OF THE SPEECH PATHOLOGIST IN THE READING PROCESS

DR. NORMA REES

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THE ROLE OF THE SPEECH PATHOLOGIST IN THE READING PROCESS

Dr. Norma S. Rees

The speech pathologist and the reading teacher have traditionally been members of the special education team responsible for the management of the learning disability child. The usual justification for this combining of talents is that the child with a reading problem frequently also has a speech problem; or, on a somewhat more theoretical basis, that a reading difficulty or other learning disorder may be traced to an underlying deficit in auditory skills, which the speech and hearing specialist is supposed to know something about. I wish to take the position that the speech pathologist has an intimate connection to the acquisition of reading, although not for the reasons just listed. A proper rationale for this connection comes instead, firstly, from an examination of the relationship of reading to language and speech, and secondly, from a review of some recent work in linguistic science and its implication for both reading and speech instruction.

Some general points about language and reading may be useful as an introduction. Language is obviously primary to reading. No peoples of the earth are without spoken language, while many have existed without written language (Jacobson, 1972). In addition, it is now well known from the recent surge of studies on normal language acquisition that children ordinarily master the bulk of the rules for speaking and understanding their native language by the time they start school, yet with few exceptions children at this age have not yet begun to read. Such authorities as Chomsky (1965) and McNeill (1970) have proposed that an important component in the child's ability to learn a language is part of his biological endowment; in other words, that the human child arrives on the scene with a strategy for inducing the rules of his language that will make it possible for him to acquire language skills rapidly and efficiently without anything like special training. In contrast, it would be laughable to suggest that the ability to read is based on innate factors. While learning a first language comes easily, automatically, and naturally to normal children growing up in normal environments, learning to read is another matter altogether. It is the exceptional, not the typical child who learns to read without several years of special instruction; and what is more serious, even with an educational system that is geared especially to teach children to read, many children experience considerable difficulty in mastering this skill

(Klasen, 1972). One conclusion these observations lead to, as was pointed out at a recent conference, is that learning to talk is easy while learning to read is hard (Kavanagh and Mattingly, 1972). A second and related conclusion is that "reading is parasitic on language" (Kavanagh, 1968). The last statement is not merely intuitively obvious, as some recent work by Levin and Kaplan (1971) has shown. These authors were interested in how readers, given as input a string of superficial visual symbols, retrieve the underlying meaning or functional relations of the message. Their experimental technique involved the use of the EYE-VOICE SPAN, or the distance that the eye is ahead of the voice in oral reading. Their results showed that efficient readers tend to read, not word-by-word or in random larger chunks, but in phrase units based on the structure and content of the reading passage. They concluded that readers assign tentative interpretations to the material as they proceed, and confirm or alter these interpretations in agreement with additional grammatical or semantic context. THE POINT IS THAT IN ORDER TO DO THIS, READERS MUST KNOW THEIR LANGUAGE. THE APPLICATION OF A TECHNIQUE FOR EFFICIENT READING IS THEREFORE DEPENDENT ON THE READER'S KNOWLEDGE OF THE STRUCTURAL AND SEMANTIC CONSTRAINTS OF THE LANGUAGE OF THE TEXT.

That language is primary to reading leads to a second introductory point well known to teachers of reading: Alphabetic writing systems like English are based on phonemic segmentation of the language in its spoken form. In the case of English, the alphabetic system is, of course, not a very faithful mirror of the phonological system of the language, but it is a fairly simple matter to discover and utilize a system of sound-symbol or phoneme-grapheme correspondences, which teachers of reading ordinarily do as part of the "phonics" approach. This method has often been called the "linguistic" approach to reading instruction; while the technique appears to have benefited from a nod in the direction of phonetics, it would seem an unfortunate term in that the science of linguistics has obviously a great deal more to teach one who is interested in the process of reading than merely an account of phonemic segmentation of speech (Wardhaugh, 1969).

The relationship of alphabetic writing to the spoken language is not however, merely a system of substitutions of graphic symbols for auditory ones, because the spoken language itself does not consist of strings of phonemes. In fact, one of the most illuminating recent results of research in linguistic science has been the identification of the nature of the speech code. Among other things, this work has been able to account for the point mentioned above, that learning speech is easy while learning reading is difficult. Language for the ear has a special status not shared by language for the eye, as is revealed by the fact that humans cannot learn ordinary language at all if they are limited to the use of some form of visual display of that language. Some of you may be familiar with the tale of Tarzan of the Apes, who supposedly taught himself to read English before he had heard any human language, by means of studying some primers his missionary father had left behind. That sort of thing works well in fiction, but is not less fanciful than Tarzan's other remarkable exploits. In fact, any system that transduces the spoken message directly into a visual display is almost impossible for anyone to "read" even if he already knows the language. For example, speech scientists can produce spectrograms, or visual representations of the speech signal displaying the parameters of frequency, intensity, and time, but they are not able to "read" such a spectrogram in the sense of retrieving the spoken message that it represents (Liberman, Cooper, and Studdert-Kennedy, 1967). The same problem occurs with mechanisms designed to produce spoken language for the deaf in a visual form. These "speech analyzing aids" have in some cases shown promise in aiding the classroom teacher of the deaf to improve the children's own speech performance, but there seems little hope that such devices could help the deaf to learn language or for that matter, to understand spoken language even once its fundamentals have been learned (Levitt and Nye, 1971). These experiences suggest that while the visual code may supplement the spoken code, it cannot substitute for it. But is this true for all communication by eye? Some forms of visual communication are codes that can be "cracked" without reference to the spoken form of the language; among these are the sign-language of the deaf (not finger-spelling, of course), and pictographic writing systems like Egyptian hieroglyphs or Chinese hieroglyphs or Chinese calligraphy. We must modify the earlier statement, therefore, to say rather that to the degree that any set of visual symbols is dependent on the speech code, it cannot totally substitute for speech as a medium for transmitting linguistic material. We have already seen that even with training linguistic scientists cannot convert spectrograms into messages by mere visual inspection. In addition, there is considerable information about the difficulty of producing reading machines for the blind (Cooper, Gaitenby, Mattingly, and Umeda, 1969). Engineers can build machines that scan and analyze printed text quite accurately, but these devices do not produce sound that is intelligible to the blind users until the scientists design them to do what readers do - that is, to retrieve the spoken code from the written alphabet on the basis of their knowledge of the spoken code. Until that "knowledge" is programmed into the reading machine, as has been done with some success by employing synthesis-by-rule techniques, the reading machine produces no acoustic output that the blind can learn to follow at anything like the rate of comprehension of speech.

These examples serve to make it clear that the speech code differs from the alphabet in a very profound respect. While the alphabet may be accurately characterized as a cipher having a fairly simple correspondence to the segmental phonemes of the language, speech is in contrast a complex code. The speech signal does not in any simple way represent the phonemes of language in a segmental fashion (Cooper,1972). The speech signal cannot be segmented into units that correspond to phonemes. The segmentation of spoken utterances into a string of phonemes is therefore the result of the first stage of linguistic decoding, or phonological analysis. One of the earliest skills acquired by the language user is this type of decoding; the fact that he learns it so easily, as mentioned before, suggests that there is a profound and intimate biological relationship among the auditory, articulatory, and neurological mechanisms subserving this process. There is evidence that the type of speech perception made possible by this biological endowment is available to infants even as young as one month, who have been reported to discriminate between voiced and voiceless consonants in syllables like /ba/ and /pa/ (Eimas, et.al., 1971). Therefore, while the human user of language has no difficulty learning to unravel the speech code to get at the underlying phonology, he cannot use a visual display in the same way; what he can learn to use, however, is a set of visual symbols that represent the phonemic segmentation rather than the speech signal itself. Obviously, however, and here is the point, he cannot make any use of visual symbols of this type unless he has first learned the phonological system that the speech signal represents. To put it another way, I seem to be making the rather obvious point that before a child can learn to read, he must know his language.

Lest it all seem too simple, let us examine what the child must know about his language as a prerequisite for learning to read. He must, first of all, possess an integrated set of internalized rules that enable him to produce sentences he has not spoken before and to understand sentences he has not heard before. THESE RULES MAY BE CHARACTERIZED AS SEMANTIC, SYNTACTIC, AND PHONOLOGICAL. If the above comments about the speech code are relevant, we should also include rules for speech (Cooper, 1972). Describing the language-user's competence as knowing the rules of the language does not, however, imply that this knowledge is at all conscious. In fact, it is well known that it is extremely difficult to make explicit the kind of rules we are talking about. Although the child at a tender age can apply rules to encode and decode meaning in sentences (semantic rules), to recognize and construct the syntax of sentences (syntactic rules), and to analyze and organize the spoken form of the utterance (phonological and speech rules), neither the child nor the adult can ordinarily specify the rules he follows in so doing. One of the prerequisites for learning to read, then, is the possession of a well-established set of rules for producing and comprehending language as well as a set of strategies for applying these rules, but none of this needs to be at the level of conscious awareness; in fact, it is essential that all of these skills operate automatically for smoothly integrated linguistic performance.

It has been suggested, however, that in order to learn to read a language with a written form like that of English, at least one aspect of the language user's competence must be brought to the level of conscious awareness; the phonological analysis of the spoken form of the language, so that the reader can learn the relatively simple correspondence between the units of the visual string and the phonemic units of the spoken message (Liberman, 1971; Mattingly, 1972). As Isabelle Liberman has convincingly pointed out, "Seeing the written word, being able to discriminate the individual optical shapes, being able to read the names of the three letters, and even knowing the individual sounds for the three letters, cannot help (the child) in really reading the word 'cat' (as opposed to memorizing its appearance as a sight word), unless he realizes that the word 'cat' in his vocabulary has three segments." (Liberman, 1971).

The status of the phoneme as a psychological unit in speech perception was examined in a clever experiment by Savin and Bever (1970). These investigators showed that adult subjects handle syllables more efficiently than phoneme segments in a perceptual task. Adult subjects were instructed to respond as rapidly as possible to the initial phonemes of nonsense syllables like bab and sab; these subjects responded more rapidly to the target phoneme when they were told in advance the syllable that the phoneme began than when they were told only what phoneme to listen for. These results showed that adult subjects perceive syllables more efficiently than they perceive phoneme segments, suggesting that even though the linguistically sophisticated adult may be able to analyze a spoken utterance as a string of phonemes, his first tendency is to react to units of speech as large as syllables. We seem, therefore, to be talking about two different kinds of linguistic skill that the would-be reader must possess; he must be capable of what Mattingly has called "primary linguistic activity," the ability to apply a set of internalized, unconscious rules to the production and comprehension of sentences; and, on a different level, he must have a "linguistic awareness" that enables him to talk about his language or to reflect on it, but also enables him to handle written text in alphabetic form (Mattingly, 1972).

The purpose of the foregoing somewhat detailed review was to support my earlier assertion that the speech pathologist's role in reading instruction is something more than the identification and remediation of coexisting defects of articulation. The speech pathologist has as his domain all aspects of speech and language, with particular emphasis on the establishment of the internalized rules that comprise language competence, or as it is sometimes called, "inner language," as well as the application of those rules to understanding and producing appropriate spoken utterances. That is the scope of his training and experience, or should be; therefore the speech pathologist has the responsibility to assess language skills and identify the nature and extent of language deficit, as well as to make appropriate referrals and to design and carry out plans of intervention aimed at bringing the child up to his capacities in language skills. The speech pathologist's approach is based on the model of semantic, syntactic, and phonological aspects of language outlined earlier. He has available to him a wide battery of test materials to assess the child's linguistic performance in all three areas and from which to make intelligent inferences about what the child "knows" about his language. The speech pathologist is armed with normative data about the maturational stages of linguistic skill in these areas, as well as teaching strategies for establishing new linguistic behaviors. The speech pathologist, in short, has the responsiblity for developing in the child the linguistic prerequisite for reading that Mattingly (1972) termed "primary linguistic activity." I am not suggesting that anything like the last word has been said on either the theoretical or clinical aspects of this issue, but I do wish to emphasize that the recent explosion of information about child language has provided for language specialists the kind of data and teaching methods that were previously lacking in an organized fashion. The speech pathologist is also a language pathologist, a point of view that any glance at current training curricula and recent published literature will support.

Moreover, the speech pathologist can be of assistance to the reading teacher not only in reference to the linguistic skills that are the underpinnings of reading ability, but also indirectly in assisting the reading teacher to develop in children the "linguistic awareness" that Liberman and Mattingly identify as fundamental to reading a language like English. The speech pathologist is a past master at convincing children that spoken words may be segmented, on some level of abstraction, into discrete phonemic segments. In fact, the notion that helping the child to overcome any articulation defects he may have will improve his reading skills is probably an accurate one for this very reason; when the speech pathologist teaches articulation, he is likely to utilize techniques that incidentally develop in the child the PHONOLOGICAL "LINGUISTIC AWARENESS" that he needs to learn to read!

This discussion would be incomplete without some further remarks about the matter of auditory perception. The role of auditory perception in reading skill deserves special attention, partly because so much has been said about it and partly because auditory skills are generally agreed to have something to do with speech pathology. Notwithstanding the very considerable tradition linking reading difficulty to disorders of auditory processing (Klasen, 1972; Calfee, Chapman, and Venezky, 1972; Flower, 1965; Johnson and Myklebust, 1967; Chalfant and Scheffelin, 1969; Chalfant and Flathouse, 1971), auditory perception is probably not central to the problem any more than visual perception is. That difficulties in visual perception do not appear to underlie the bulk of reading disorders has been shown by the work of Kolers (1972), who pointed out that skilled readers read far too fast to see every letter in sequence. Kolers' experiments have revealed that readers can see only about three or four letters per second, or an average of 35 words per minute, while skilled adult readers average about 300 words per minute! Kolers concluded that "The experiment...disproved the idea that ordinary reading proceeds by a sequential perception of the individual letters composing words." Even the suggestion that children who are poor readers, in contrast to skilled adult readers, fail mostly at the job of visual perception of letters or sequences of letters has been shown untenable by the work of Shankweiler and Liberman (1972), whose careful surveys revealed that letter reversals (b for d) and sequence reversals (saw for was) were in no way correlated with each other in children's reading errors, and furthermore, that neither type of visual perception error accounted for more than a small proportion of the total errors. Neither is there much foundation for the notion that most reading disorders originate in auditory perception difficulties like auditory discrimination (distinquishing between minimal pairs like pat and bat), auditory memory span (recalling a series of digits), auditory sequencing (repeating a sequence in the order given), or auditory synthesis (sound blending). Inasmuch as the children who are supposed to have these problems typically have essentially normal patterns of speech and language, it is apparent that they have all the necessary auditory skills for language. It makes little sense to say that a child with normal speech or even one who misarticulates /r/ or /s/ has a fundamental problem with auditory discrimination. It is true, however, that in correlational studies examining the auditory skills of children with reading disorders, these children do significantly more poorly on tasks like those listed above, but there is no good argument to support the conclusion that this association is a causal one (Klasen, 1972). In fact, there is much to favor the suggestion of Dykman et. al., (1971) that most disorders of learning, usually thought to result from faulty perception, are instead reducible to disorders of attention. Both reading teachers and speech pathologists will tell me that when they give reading-disordered children careful training in auditory skills, their reading tends to improve, and I am sure that is so; but I believe that the prime value of this training is to convince the child that in some inaccurate but usable way the alphabetic writing system reflects how words are pronounced, and so sets him on his way to developing a strategy for approaching new words. In particular, there is scant justification for going through all the recommended initial steps like giving children practice in identifying environmental noises (Chalfant and Flathouse, 1971; Zigmond and Cicci 1968). ALL THE AVAILABLE EVIDENCE SHOWS THAT THE AUDITORY PROCESSING OF SPEECH IS SIGNIFICANTLY DIFFERENT FROM THE PROCESSING OF ALL OTHER AUDIBLE SOUND (Jakobson 1972; Liberman, et. al., 1967). If learning to respond correctly to nonspeech stimuli does anything at all for the child, it gains his attention, which in the light of the work by Dykman et. al., (1971) is a not inconsiderable accomplishment. So while training in the so-called "auditory skills," whether given by the speech pathologist or the reading teacher, may have some tangential value for the child who is learning to read, I think it is a mistake to spend a great deal of time on this work on the grounds that it provides the child with basic elements fundamental to reading, or to speaking, which it mostly does not.

To get back to the starting point, which is where all good speeches are supposed to end, the speech pathologist has an essential contribution to make to the processing of reading acquisition, both in normal and learning disabled children. But the speech pathologist can make this contribution only when he functions as a language specialist, and not when his role is limited to that of articulation therapist.

FOLLOW-UP QUESTIONS RAISED BY THE PARTICIPANTS TO SERVE AS A BASIS FOR GROUP DISCUSSION:

To: Rees, Dr. Norma

1) Current research suggests that there is a profound and intimate biological relationship among the auditory, articulatory, and neurological mechanisms subserving linguistic decoding or phonological analysis. With this in mind, what are some of the tools the speech pathologist can use in developing speech perception in the child?

2) It has been suggested that the speech pathologist has the responsibility for developing in the child the linguistic prerequisites for reading. What clinical methodolgy can be suggested for the below-grade reader who is deficient in linguistic preparation?

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Dr. Norma S. Rees

INTERRELATIONSHIPS OF DISCIPLINES IN LANGUAGE STUDY AND DEVELOPMENT

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INTERRELATIONSHIPS OF DISCIPLINES IN LANGUAGE STUDY AND DEVELOPMENT

Mardel Ogilvie, Ph.D.

For the past two days we've heard from specialists in reading, language and learning disabilities. Such a cooperative endeavor, is, I am sure, being replicated country-wide. No longer can the reading specialist, the speech specialist, or the learning disabilities specialist isolate himself from members of other disciplines, for, the study of language involves the reading specialist, the education specialist, the speech specialist, the linguist, the sociologist, the psychologist.

Some evidence of the interrelationships of studies in these areas has always been evident but at this particular time the studies involving interrelationships have burgeoned. The dependence of one specialist upon the work of another is noteworthy. When J.B. Carroll, P. Davies and B. Richman's recent book THE AMERICAN HERITAGE WORD FREQUENCY BOOK (Houghton Mifflin 1971) came out, journals specializing in speech, education, psychology, linguistics, reading, and education reviewed it.

Another example is evident in citations. Footnotes in the June 1972 JOURNAL OF SPEECH AND HEARING RESEARCH includes citations from the areas of neurology, phonology, grammar, psychology, learning disabilities, and sociology. In an article in the December 1972 issue of The JOURNAL OF LEARNING DISABILITIES, a speech pathologist from the Disorders Center at Wisconsin refers to studies in psycholinguistics, to tests designed to discover potential reading abilities, to the Peabody Language Kit, to the Illinois Test of Psycholinguistic Disabilities test, to comparative psychology of mental development, to psychological testing--surely a crossing of many, many disciplines. Similarly a single article in November 1972 issue of ELEMENTARY ENGLISH "Theoretical Frameworks of English Orthography" includes citations from books of sociology, phonology, transformational grammar, reading child development and from journals having to do with verbal learning and behavior, reading, education, and speech disorders.

Research on language of children in kindergarten has been reported in this year's issues of ELEMENTARY ENGLISH, READING TEACHER, CHILD DEVELOPMENT, JOURNAL OF LEARNING DISABILITIES. For instance, K. Eleanor Christenson reports a study "Language Facility of Kindergarten Children" in the November 1972 issue of ELEMENTARY ENGLISH (1107-1112) in which she describes the investigation of the effects of two kindergarten programs, social class and sex upon children's oral syntactical ability. The one program was the control; the other used an adaptation from the language experience approach to reading. Based on the Kellogg Hunt unit she found no significant differences in the two groups however, the individual variables did act together and there was a difference in the number of multi units.

In the December 1972 issue of the JOURNAL OF LEARNING DISABILITIES there is an article co-authored by Joyce Stewart Evans, a program coordinator of early Childhood Division of the Southwest Education Development laboratory in Austin and by Tina Bangs who is acting director of the Division of Communicative Disorders from the University of Texas. Note that these two authors are from different disciplines and with different training. Their article is entitled "Effects of Preschool Language Training on Later Academic Achievement of Children with Language and Learning Disabilities." The children for this study were selected for training on the basis of an instrument designed to identify and to assess those predicted to have later academic abilities. Seventy percent of the children who completed the pre-academic program in 1963 were in 1969 achieving at grade levels.

Another area where cooperative endeavors are proving fruitful is in attacking the problem of whether nonstandard dialect pronunciations interfere in school performance of reading. These endeavors are world-wide. More recently the relationship of nonstandard dialect to spelling has been raised. Linguists, anthropolotists, reading specialists, speech pathologists, language arts educators are all researching this area. Doctoral studies based on this question are in progress in almost every university.

The speech specialists no longer has a corner on nonsense syllables and words--frequently used in testing discrimination and in articulation therapy. The December 1972 issue of ELEMENTARY ENGLISH reveals that the educator is using nonsense words to test generalization ability in spelling. The interrelationships are apparent in classroom practice. In this same issue of ELEMENTARY ENGLISH a study by Byron Callaway, Harry McDaniel, and George E. Mason on "Five Methods of Teaching Language Arts" (Elementary English, December 1972, 1240-1245) is reported. They note that achievement in the language arts is increased when the instructional program in one of the language arts such as spelling, composition, speaking, or reading is carefully coordinated or correlated with the instructional program in other language arts. They further indicate that failure to coordinate lessens achievement, e.g., writing composition increases reading; teaching spelling for its own sake appears to be poor practice.

The relationship among articulatory deficiencies, syntactical development, and reading difficulties needs further exploration. Underlying factors may be due to delays in four developmental functions noted by Frostig: (1) sensory motor, (2) language, (3) perception, (4) higher cognitive processes. The sensory-motor functions, developing maximally to two years give the child an experiential background in using all his sense modalities and movements in his environment. The language functions developing maximally from one and a half to the age of three or four, help the child to receive and express ideas through speech. The perceptual development, from three and a half to seven and a half years helps the child to discriminate and recognize stimuli within his environment. He uses largely the modalities of hearing and seeing. His immediate perceptions determine his thought processes. In the development of the higher cognitive processes, the child develops and continues to develop abilities that deepen his awareness and understanding of the environment and of himself as a person. These processes are not limited to the recognition of stimuli that are immediately present. Two other functions, social adjustment and emotional development also play important roles. (Frostig, M. and P. Maslow, "Language Training: A Form of Ability Training," JOURNAL OF LEARNING DISABILITIES I, February 1968, 105-115.) To study, to evaluate the role of these developmental functions, we need the coordinated efforts of the psychologist, the reading specialist, the speech specialist, linguist, and sociologist.